ESSENTIALS of GEOGRAPHY

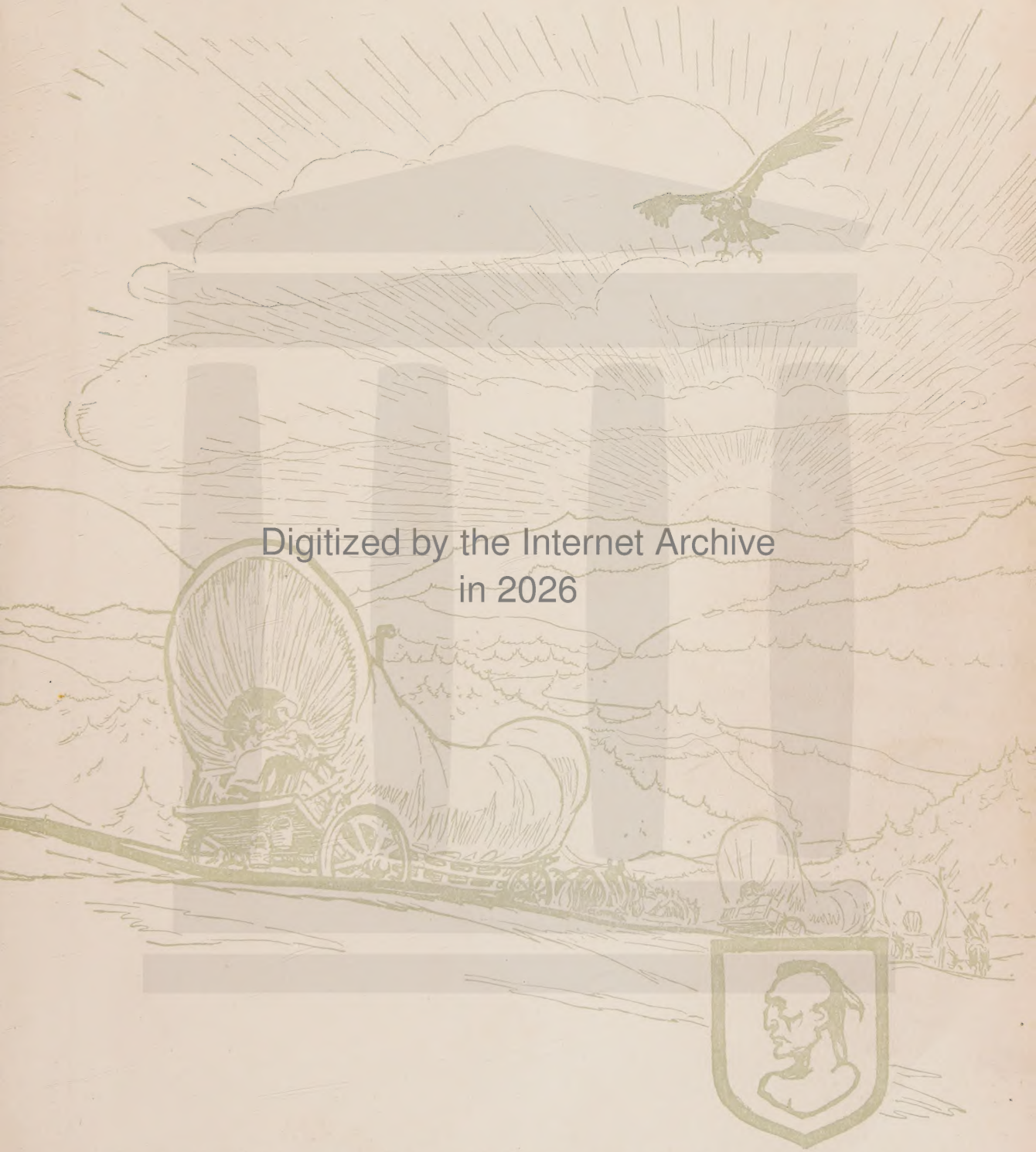
BRIGHAM AND McFARLANE

SECOND BOOK

PART TWO

REVISED EDITION

AMERICAN BOOK COMPANY



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ESSENTIALS *of* GEOGRAPHY

SECOND BOOK

PART TWO

BY

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ESSENTIALS OF GEOGRAPHY

TWO-BOOK SERIES:

First Book	272 pages
Second Book	432 pages

FOUR-BOOK SERIES:

First Book, Part One	98 pages
How Men Work and Live, The Earth as a Whole, brief account of North America and of the United States as a Whole	
First Book, Part Two	196 pages
The various continents and countries of the earth	
Second Book, Part One	240 pages
North America and its countries	
Second Book, Part Two	220 pages
The various continents and countries of the earth excepting North America; oceans and world winds; mathematical geography	

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ESSENTIALS OF GEOGRAPHY, SECOND BOOK, PART TWO.

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PREFACE

In this series of texts it is recognized that the physical and the human are coördinate branches of geography.

Every important phase of physical geography is sufficiently covered, but care has been taken not to give it the emphasis which is suited only to the high school or the college.

In pursuance of emphasis on the human side of geography, the materials and modes of life, industry, and trade are given more than the usual proportion of attention. Moreover, industries and the growth of trade centers furnish out-door material for teaching in every locality; while routes of transportation and the contribution of the whole world to the needs of a single community can be so studied as to give the pupil inspiring ideas of the unity of the world and its people.

The map is the central feature in geographic instruction. Hence great care has been taken to reach excellence in the maps of this series. Essential features are shown, but minor features are omitted to avoid vagueness of impression. For this reason it is necessary to omit the smaller cities and towns of each state or region, although some of the omitted cities in densely populated states may be places of considerable size. The contour maps of the United States Geological Survey now cover wide areas and are of such general interest that they have been given special explanation.

In the text, the causal relation is central and vital, but emphasis is also placed upon the study of location, as in the map questions that precede leading divisions of this book, and in the reviews that follow. Location should also be pressed home in the study of industrial, commercial, and other phases.

The principles and forces with which physical geography deals are brought in at appropriate points of application in the regional treatment. Thus rivers and valleys are studied in a passage that leads to the account of the drainage of North America; and volcanoes are explained in connection with the study of a well-known volcano, Vesuvius.

In the handling of all great topics, concentration and unity are sought, so that the reader will not have to depend on diffused and scattered notices. Wheat, for example, is described as fully as possible in the account of the region where it first appears in a large way, that is, the North Central States. In like manner iron is treated with Pittsburgh, and irrigation with the Plateau States.

Because of the difficulty of the subject, a progressive treatment has been adopted in the study of the atmosphere, and the student is led by simple steps to a knowledge of the main facts. Under North America, climate is studied as to range of temperature, the westerly winds, and the northeast trades. Under the United States the subject is expanded by a study of rainfall and by an explanation of cyclonic movements and storms. The theme is further advanced under the several state groups. The southeast trades and the westerly winds of the Southern Hemisphere are taken up under South America. Following the treatment of the ocean, the various facts about winds are brought together and amplified, and a view of world winds is presented.

The earth as a whole and its astronomical relations are treated in a simple manner in the First Book of the series, and the fuller study is then postponed to the end of the Second Book, when the pupil is best prepared to understand the more detailed facts then presented.

The authors gratefully acknowledge the helpful suggestions of many expert teachers of geography. For assistance in illustration, they are greatly indebted to several departments of the United States Government, to many American Consuls in foreign countries, to a large number of industrial establishments, to boards of trade both at home and abroad, and to the personal kindness of many geographers in America and Europe.

Albert Perry Brigham
Charles T. McFarlane

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A BRIEF REVIEW OF NORTH AMERICA

1. North America a New Continent.—When Columbus and other explorers from Europe discovered the various parts of North America, they found both land and people very different from those of the old world. The countries from which they came, such as Italy, Spain, and Great Britain, had been inhabited by civilized people for many hundred years. These older countries were covered with farms, villages, and cities. The cities were joined to one another by highways, and in many of them were splendid churches, palaces, universities, and great markets.

Fig. 1. Natural forest regions of North America

In North America all was new. A few half-clad red men met the discoverers, sometimes in friendly ways, sometimes with hostility; but the natives were always curious to see the white people, and to touch or possess the wonderful objects which they brought with them.

Except in small parts of southern North America there were no buildings of hewn stone. A few of the more skillful Indians lived in small wooden cabins, the rest in wigwams. A few acres here and there had been brought under cultivation, but the tillage was of the simplest kind, and was all done by hand labor. The total number of persons on the North American continent may not have been more than a few hundred thousand.

When North America was first visited by Europeans, most of it was forested (Fig. 1). From the present states of Indiana and Arkansas eastward to the Atlantic Ocean the land was covered with a continuous forest, where now the greater part of the surface is cleared and inhabited, with only wood lots to represent what was once primeval forest. In the prairie regions of central North America the trees were mainly found as they are to-day, along the streams, while the intervening upland spaces were unforested. Also in the dry regions of the west and in the cold regions of northern Canada, there were vast, treeless areas where the landscape appeared the same as at the present time.

Such was North America as it looked four hundred years ago, when the scattering red men roamed in its silent forests and across its green prairies and its gray and windy deserts.

2. Climate of North America.—Man can clear away the forests and plow the soil, covering the fields with new and useful plants, but he cannot change the climate of a region. He can only adapt himself to it, protecting himself against its heat and its cold, compelling the sunlight, the rain, and the soil to yield him rich harvests. Where the rains are heavy now, they were heavy in the days of the discoverers, and where then the Indian family crossed the desert, eagerly peering for streams or water holes, there must the white man also struggle as best he can with the meager gifts of nature. In winter most of the northern United States and most of Canada were

Fig. 11
Political
NORTH AMERICA

S-2

white with their snowy mantle as they are in our own day; but now our furnaces and our railroads make light of winter's blockade and frosts, and, except in the fields, life moves on in January as in July.

North America has greater extremes of climate than any other continent except Asia. Like Asia it extends from Arctic latitudes far south of the Tropic of Cancer, and thus embraces cold, temperate, and hot climates. The differences in climate are due mainly to differences of latitude.

Some of the variations of climate are due to differences in the altitude of the lands, and in the relations of the land to the ocean. British Columbia has a mild and even climate, with cool summers and moderate winters, because the prevailing westerly winds bring to the Pacific coast lands the nearly stable temperature of the waters of the Pacific Ocean. But in similar latitudes the shores of Hudson Bay and of Labrador are cheerless and barren, and very cold in winter; for the westerly winds that render mild the coast lands of the west lose their heat in crossing the broad expanse of cold northern lands.

In like manner Washington, Oregon, and California have their winter and summer somewhat equalized, while the interior of our country is marked by cold winters and hot summers; that is, it has a continental climate. Along the Gulf and Atlantic shores of the United States the climate is made somewhat mild and equable by the influence of occasional winds from the Gulf of Mexico and the Atlantic Ocean.

Thus the prevailing westerly winds influence the climate of most of the continent; while the trade winds from the northeast affect the West Indies, Mexico, and Central America. These important systems of prevailing winds are exhibited in Figure 33.

Fig. 33. Prevailing westerlies and trade winds

Vancouver
Bellingham
Everett
Seattle
Spokane
Tacoma
Yakima
Olympia
Portland
Astoria
Salem
Eugene
Baker
Medford
Boise
Pocatello
Mt. Shasta
Lassen Peak
Reno
Carson City
Ely
Tonopah
Goldfield
Mt. Whitney
Sacramento
San Francisco
Berkeley
Oakland
Pt. Conception
Pasadena
Los Angeles
San Diego
Prescott
Phoenix
Globe
Tucson
Bisbee
Douglas
Kalispell
Missoula
Great Falls
Helena
Butte
Anaconda
Miles City
Billings
Walla Walla
Glacier National Park
Yellowstone National Park
Sheridan
Lead
Pierre
Aberdeen
Watertown
Minot
Grand Forks
Bismarck
Fargo
Sioux Falls
Rock Springs
Laramie
Cheyenne
Grand Island
Omaha
Lincoln
Ft. Collins
Greeley
Boulder
Denver
Leadville
Grand Junction
Colorado Springs
Pueblo
Cripple Creek
Trinidad
Raton
Santa Fe
Las Vegas
Albuquerque
Roswell
Las Cruces
El Paso
Amarillo
Fort Worth
Dallas
Waco
Austin
Houston
San Antonio
Laredo
Brownsville
Topeka
Wichita
Hutchinson
Enid
Oklahoma City
Muskogee
Tulsa
Atchison
Logan
Ogden
Provo
Salt Lake City
Great Salt Lake
Wasatch Mts.
Uinta Mts.
Sierra Nevada
Coast Ranges
Cascade Mts.
Lower California
Gulf of California
Mexico
Dominion
Winnipeg
L. Manitoba
L. Winnipeg
Longitude West

Fig. 46
Political
UNITED STATES
Capitals of Countries thus: ◎
Capitals of States thus: ⊙
Scale of Statute Miles
0 50 100 200 300
252 MILES TO ONE INCH
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THE MATTHEWS-NORTHRUP WORKS, BUFFALO, N. Y.
from Greenwich
S-2
CANADA
UNITED STATES
MEXICO
GULF OF MEXICO
ATLANTIC OCEAN
Lake Superior
Lake Michigan
Lake Huron
Lake Erie
Lake Ontario
Great Lakes
Ottawa R.
St. Lawrence R.
Mississippi R.
Missouri R.
Ohio R.
Rio Grande
Colorado R.
Columbia R.
Yukon R.
Hudson R.
Potomac R.
Delaware Bay
Chesapeake Bay
Tampa Bay
Lake Okeechobee
Florida Straits
Tropic of Cancer
Havana
Key West
Nassau
BAHAMA ISLANDS
CUBA
Quebec
Montreal
Toronto
Ottawa
Hamilton
Buffalo
Rochester
Albany
Boston
New York
Philadelphia
Baltimore
Washington
Pittsburgh
Cleveland
Detroit
Chicago
Milwaukee
Minneapolis
St. Paul
Duluth
Superior
Sault Ste. Marie
Winnipeg
Portland
Bangor
Augusta
Manchester
Concord
Providence
Hartford
New Haven
Nantucket I.
Martha's Vineyard
Long I.
Scranton
Wilkes-Barre
Newark
Jersey City
Trenton
Reading
Harrisburg
Wilmington
Dover
Annapolis
Richmond
Norfolk
Roanoke
Charleston
Cincinnati
Columbus
Dayton
Toledo
Youngstown
Akron
Wheeling
Indianapolis
Terre Haute
Fort Wayne
South Bend
Peoria
Springfield
Chicago
Rockford
Milwaukee
Racine
Madison
Oshkosh
Green Bay
Saginaw
Bay City
Flint
Grand Rapids
Lansing
Detroit
St. Clair
Erie
Watertown
Utica
Syracuse
Rochester
Binghamton
Troy
Worcester
Lowell
Lawrence
Lexington
Concord
Bunker Hill
Boston
Cape Cod
Adirondack Mts.
White Mts.
Green Mts.
Mohawk R.
Hudson R.
Erie Canal
Welland Canal
St. Marys River and Canal
Straits of Mackinac
Lake Champlain
Lake George
Lake Winnipesaukee
Lake Memphremagog
Lake St. John
Saguenay R.
St. John R.
Bay of Fundy
Mt. Katahdin
Mt. Washington
Mt. Mitchell
Asheville
Knoxville
Nashville
Chattanooga
Memphis
Fort Smith
Little Rock
Hot Springs
Pine Bluff
Shreveport
Vicksburg
Jackson
Natchez
Meridian
Birmingham
Montgomery
Mobile
Pensacola
Tallahassee
Jacksonville
St. Augustine
Atlanta
Augusta
Macon
Savannah
Columbia
Charleston
Wilmington
Raleigh
Winston-Salem
Charlotte
Greensboro
Lynchburg
Roanoke
Norfolk
Richmond
Petersburg
Alexandria
Washington
Baltimore
Annapolis
Dover
Wilmington
Trenton
Reading
Harrisburg
Pittsburgh
Scranton
Wilkes-Barre
Jersey City
Newark
New York
Long I.
Hartford
New Haven
Providence
Boston
Cape Cod
Nantucket I.
Martha's Vineyard
Portland
Bangor
Augusta
Manchester
Concord
Montpelier
White Mts.
Green Mts.
Lake Champlain
Lake George
Lake Winnipesaukee
Lake Memphremagog
St. John R.
Bay of Fundy
Mt. Katahdin
Quebec
St. Lawrence R.
Ottawa R.
Great Lakes
Lake Superior
Lake Michigan
Lake Huron
Lake Erie
Lake Ontario
Mississippi R.
Missouri R.
Ohio R.
Rio Grande
Colorado R.
Columbia R.
Yukon R.
Hudson R.
Potomac R.
Delaware Bay
Chesapeake Bay
Tampa Bay
Lake Okeechobee
Florida Straits
Tropic of Cancer
Havana
Key West
Nassau
BAHAMA ISLANDS
CUBA
C. Hatteras
C. Fear
C. San Blas
C. Sable
Delta of the Mississippi R.
Galveston
Baton Rouge
New Orleans
Lafayette
Beaumont
Houston
Austin
San Antonio
Dallas
Fort Worth
Waco
Abilene
Amarillo
Lubbock
Wichita Falls
Oklahoma City
Tulsa
Muskogee
Fort Smith
Little Rock
Hot Springs
Pine Bluff
Memphis
Chattanooga
Knoxville
Nashville
Asheville
Mt. Mitchell
Charlotte
Greensboro
Winston-Salem
Raleigh
Wilmington
Columbia
Charleston
Augusta
Atlanta
Macon
Savannah
Jacksonville
St. Augustine
Tallahassee
Pensacola
Mobile
Montgomery
Birmingham
Meridian
Jackson
Vicksburg
Natchez
Shreveport
Monroe
Alexandria
Lake Charles
Beaumont
Galveston
Houston
Austin
San Antonio
Corpus Christi
Brownsville
Laredo
Del Rio
El Paso
Albuquerque
Santa Fe
Las Vegas
Pueblo
Denver
Colorado Springs
Cheyenne
Laramie
Rawlins
Rock Springs
Evanston
Salt Lake City
Ogden
Provo
Carson City
Reno
Virginia City
Sacramento
San Francisco
Oakland
San Jose
Stockton
Fresno
Bakersfield
Los Angeles
San Diego
Santa Barbara
San Bernardino
Riverside
Pasadena
Long Beach
Santa Monica
Monterey
Salinas
Santa Cruz
Santa Rosa
Eureka
Crescent City
Redding
Chico
Marysville
Yuba City
Stockton
Modesto
Merced
Fresno
Visalia
Bakersfield
Tehachapi
Mojave
Barstow
Needles
Yuma
Phoenix
Tucson
Prescott
Flagstaff
Gallup
Albuquerque
Santa Fe
Las Vegas
Raton
Trinidad
Pueblo
Colorado Springs
Denver

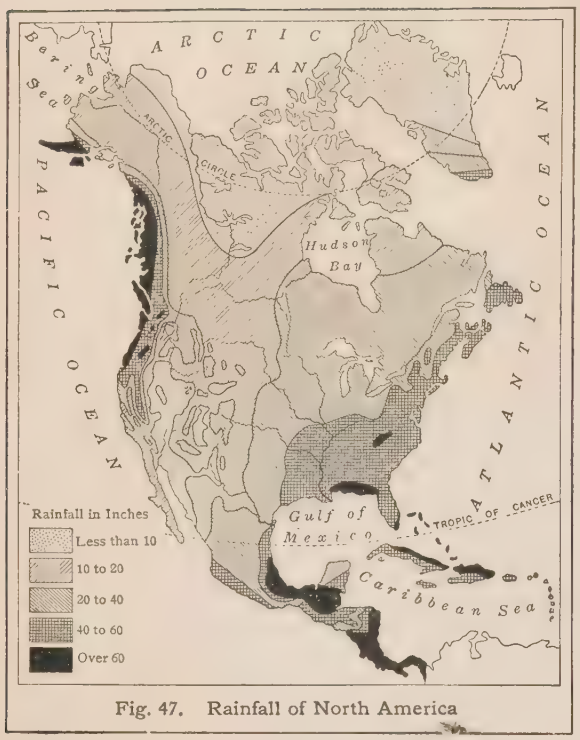

Fig. 47. Rainfall of North America

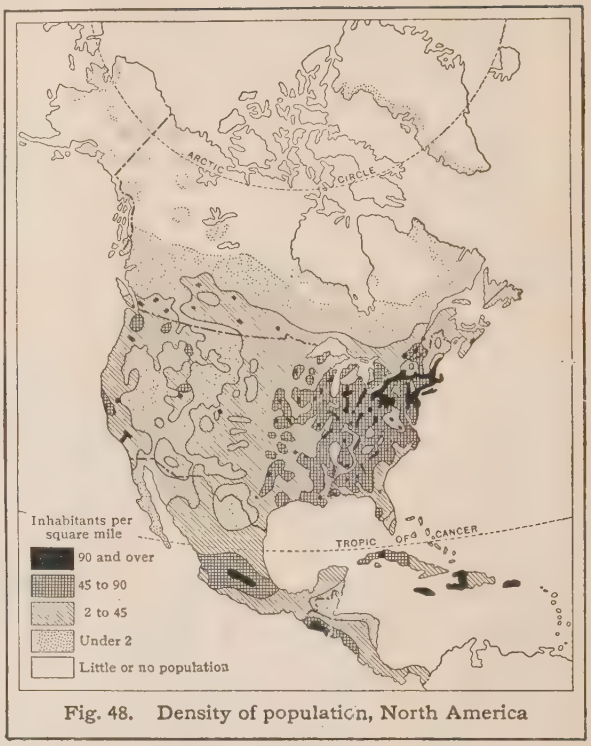

Fig. 48. Density of population, North America

As a result of winds, altitudes, and the neighborhood of the sea, rainfall is variously distributed in North America. It is heavy on most of the Pacific coast, in the eastern and southern parts of the United States, and in most of the tropical areas. It is light on the plains and plateaus of the west and the far north. The distribution of rainfall in our continent should be carefully studied upon the accompanying map (Fig. 47) because it has much to do with the distribution of the people who live in North America.

3. Where People Live in North America.— In place of the few hundred thousand red men who roamed the forests and open plains of North America before the time of Columbus, this continent now has, some four hundred years after its discovery, about 150,000,000 inhabitants. Millions of people have come from the countries of other continents, and many millions have been born here, and yet our continent is even now much less densely populated than Europe. In North America there are on the average about 15 people for each square mile. The average for Europe is about 117 per square mile.

Study the population map of North America (Fig. 48). Observe that the eastern United States and some tropical lands contain nearly all the areas of dense population. Note the position of the meridian of 100° west longitude (Fig. 46). It crosses Oklahoma, Kansas, Nebraska, and the Dakotas. East of it the people in our country live rather close together. West of it are large areas where few people live. The exceptions are mainly in favored locations in the Rocky Mountains and along the Pacific coast. Most of Canada is thinly peopled, and so also is much of northern Mexico.

Compare the population map with the rainfall map of North America. You will see a remarkable correspondence between the two maps, and will readily draw the conclusion that people choose well-watered lands when they select places for homes and for fields upon which to expend their labor.

We must not, however, conclude that the population of the west is as dense as it ever will be. We must remember that America was discovered from the east, and that the earliest and oldest settlements were made around the good harbors and along the valleys of the Atlantic seaboard. Gradually people have moved farther west, and have learned to water the fields (Fig. 49) and utilize the mineral deposits of the drier lands. This process is still going on. Within a few generations, therefore, the population map of our continent may show the results of a much greater use of fields, rivers, and mines.

Fig. 49. Irrigation canal and orchards in Washington

We may also observe the distribution of people in North America as found in cities having a population of 100,000 or more. Of 76 cities of this grade, 68 are in the United States. The others are Montreal, Toronto, Winnipeg, and Vancouver in Canada, Havana in Cuba, Port au Prince in Haiti, and Mexico city and Guadalajara in Mexico.

Of the 68 large cities of the United States, 50 are east of the Mississippi River, and if we divide the country into two nearly equal parts along the one hundredth meridian, 60 of these cities are in the eastern half. This is in harmony with what we have learned from the population map, for the largest cities and the greatest number of them are found where the population of the country is the densest.

Fig. 50. Spinning room in a cotton mill, Massachusetts

4. Occupations and Industries in North America.—In most of the older European countries a large part of the people live in towns and cities, while a smaller proportion of the inhabitants live on farms and till the soil. In new countries there are fewer cities, and many of the people occupy the farms and raise food and other products of the soil. Land is cheaper than in old and crowded countries, and the farms average much larger. The result is that the newer countries raise more grain, meat, and fruit than they can consume, and sell their surplus in old countries which do not produce enough for their own use.

Canada has few cities, but has vast areas of fertile land. It is therefore almost entirely an agricultural country. Mexico, Central America, and the West Indies are almost purely agricultural in their industries.

The United States is partly like an old and partly like a new country. In a few of the eastern states, manufactures occupy more people and more capital than farming, and there is an enormous surplus of manufactured

goods to be sold in other states and in foreign countries. On the Pacific coast, in the Mississippi Valley, and about the Great Lakes there are large cities and important centers of manufacture; but the cities are separated by great areas of rich soil, and the leading industry of the western and central states is agriculture.

In all North America, therefore, outside of the eastern United States, manufactures on a large scale are found only in a few restricted areas, or in large cities such as Montreal, Toronto, Winnipeg, Denver, San Francisco, Portland, and the cities around Puget Sound.

In spite of the fact that North America may be called an agricultural continent, the United States produces a greater value of manufactured goods than any other country in the world. This is true because it is such a vast country, with a large population skillful in the invention and use of labor-saving tools and machinery. Much the greater part of the manufactures produced in our country are used by our own people. Before the World War the value of those exported was less than the value of the manufactures exported by Great Britain. That country and others, including France, Germany, Belgium, and Switzerland, are comparatively small and densely populated, and in them manufacturing is relatively more important than it is in the United States.

In considering the agriculture of North America as a whole it is worth while to note especially the distribution of some of the leading crops.

Wheat can be raised as far south as Mexico and as far north as southern Alaska. But the bulk of the crop is raised within much narrower limits, namely, from latitude 35° in the United States to 55° in Canada. Between these parallels are included all the great wheat regions, from Missouri, Oklahoma, and Kansas in the United States, to Alberta and Saskatchewan in Canada. In the same latitudes are grown oats and smaller quantities of rye, barley, and buckwheat.

Corn is not much grown in Canada, and its largest production, in the "corn belt"

Fig. 51. Harvesting wheat in Nebraska

Fig. 52. Filling a silo with corn, Ohio

Fig. 53. Shipping cotton, New Orleans

of our country, is in the states that form the southern part of the wheat belt, especially the states of Ohio, Indiana, Illinois, Missouri, Iowa, Kansas, and Nebraska. As corn thrives in a warmer climate than wheat, it is an important crop throughout most of the southern states and in Mexico.

Cotton does not thrive north of the Ohio and Missouri rivers, and most of the cotton crop is raised in the Gulf region and in some of the South Atlantic States.

Rice, the great cereal of hot latitudes, is raised mainly in Louisiana, Texas, Arkansas, and California.

Apples and the other fruits of temperate latitudes are grown from the maritime provinces of Canada and from the New England and Middle Atlantic States westward to British Columbia, Washington (Fig. 49), and Oregon. Subtropical fruits abound in the south and southwest, particularly in Florida, Arizona, and California.

In Mexico, Central America, and the West Indies we find truly tropical products such as rubber, coffee, cacao, and bananas.

A large body of workers in North America are occupied in extracting from the earth coal, clays, building stones, and the ores of a great variety of metals, and many others are employed in the furnaces which separate and prepare these substances for their various uses. As some mineral deposits occur in the most barren and desolate regions, mining centers have grown up even among the high mountains and on the deserts of the continent. Supplies for such centers of population may be produced on the nearest available lands

Fig. 54. Coal breaker and mine in Pennsylvania

or may be brought from distant farms and factories, thus giving occupation and support to many who do not labor directly in mining industries.

In the days of the red men there was little trade in North America; for each family or clan procured its own food and made its wigwams, its blankets, its utensils, and its weapons of warfare. Now according to the modern white men's way of life, some toil on farms, some in mines and quarries, some in factories, and some in the market place. Man has made much change in the face of North America, by cutting its forests, tilling the soil, laying out roads, and building cities. But he has been guided in this work by the gifts of nature, which indicate where he must dig for minerals, where he may till the soil, and where he may best build his cities and make his roads.

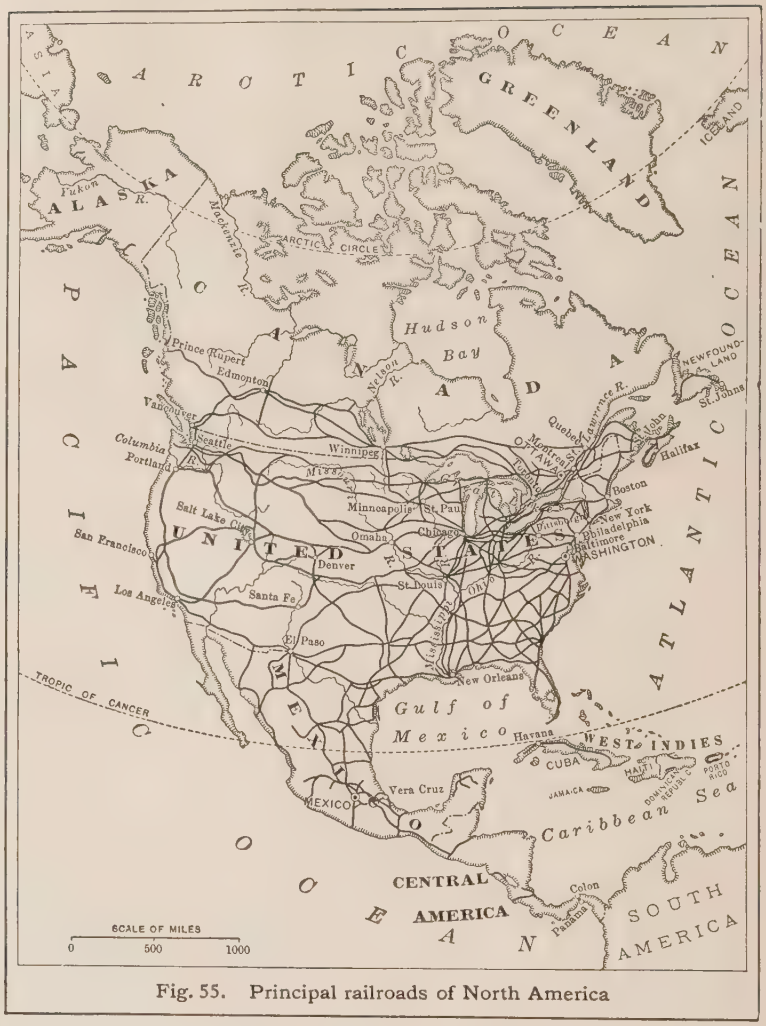

Fig. 55. Principal railroads of North America

5. Transportation Routes in North America.—Most of the older cities in North America grew up along the Atlantic coast, where there are good harbors, or where tidal rivers extend far within the land. Among such cities are Boston, New York, Philadelphia, and Baltimore, on or near the ocean; while Quebec and Montreal in Canada are on the tidal St. Lawrence River. This river, with the Great Lakes, reaches more than a thousand miles into the interior of the continent and forms one of the most important waterways in the world. No other system of interior waters carries so vast a commerce or has upon its shores so many great cities.

The Great Lakes lie between Canada and the United States; but the lower St. Lawrence River is within Canada and is therefore not a convenient outlet for products from the interior of the United States. Hence from early times the Hudson-Mohawk Valley has been the most frequented channel of traffic between New York and the Great Lakes, by means of the two rivers, the Erie Canal, and later the railroads.

Farther south there are other passes across the Appalachians. From Philadelphia the natural route leads by the Susquehanna River, and a branch of that stream, to Pittsburgh and the Ohio River. From Baltimore and Washington the natural route is up the Potomac River to the Ohio. In southern Virginia also there are passes that afford a practicable route across the Appalachians.

Fig. 56. Freight yard in New Jersey, opposite the City of New York

The railroads from the Atlantic coast have their terminals at Chicago, St. Louis, and New Orleans. After important cities arose on the harbors of the Pacific coast, and the mineral wealth of the Cordilleran highland was discovered, railroads were built to the far west. They extend from Chicago westward by way of St. Paul, Minneapolis, and Omaha to Denver, Salt Lake City, San Francisco, Portland, and Seattle. Other lines reach from St. Louis and New Orleans across the plains and mountains to Denver, Santa Fe, Los Angeles, and San Francisco.

Canada has three trunk lines of railway reaching from the Atlantic Ocean to the Pacific coast.

Between the eastern ports of North America and those of northern Europe and of the Mediterranean countries there is a vast amount of trade and travel across the Atlantic Ocean. Other lines of ocean trade and travel connect Seattle (Fig. 57), Portland, San Francisco, and Vancouver with the ports of Japan, China, the East Indies, Australia, and New Zealand. Great traffic routes girdle the earth, reaching both east and west from our continent across the bordering oceans to neighboring continents, the circle being completed by trade routes between European and Oriental centers of trade. The new continent has taken its place in the life and trade of the world, and in our marts may be found the choicest products of the industries of all nations.

Fig. 57. Steamer leaving Seattle for Alaska

Fig. 324

Political

SOUTH AMERICA

Scale of Statute Miles

0 100 200 300 400 500 600 700 800 900 1000

600 MILES TO ONE INCH

Capitals of Countries thus: ◎

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SOUTH AMERICA

	Area, Sq. Mi.	Population	Capital
Brazil	3,300,000	30,645,000	Rio de Janeiro
Paraguay	100,000	1,050,000	Asuncion
Uruguay	69,000	1,495,000	Montevideo
Argentina	1,084,000	8,699,000	Buenos Aires
Chile	293,000	3,755,000	Santiago
Bolivia	440,000	2,890,000	La Paz
Peru	440,000	4,586,000	Lima
Ecuador	118,000	2,000,000	Quito
Colombia	466,000	5,855,000	Bogota
Venezuela	364,000	2,412,000	Caracas
British Guiana	95,000	298,000	Georgetown
Dutch Guiana	50,000	113,000	Paramaribo
French Guiana	30,500	49,000	Cayenne
Falkland Is., etc.	6,570	3,000	

Map Study.—1. What is the latitude of the most northern point of South America? 2. To what country does it belong? 3. Give the name and latitude of the most southern point of South America. 4. To what country does it belong? 5. Give the longitude of the eastern and the western points of the continent, and the countries to which they belong.

Fig. 325. Punta Arenas, the southernmost city of the world

6. Beginning in the north, name in order all the countries that border Brazil. 7. What countries border the Caribbean Sea? The Atlantic Ocean? The Pacific Ocean? 8. What countries have no seacoast?

9. Comparing South and North America, which continent has the more regular coast line? 10. The chief indentations of the South American coast are the mouths of the Amazon and the Plata rivers, and Lake Maracaibo. Locate each of these. 11. Locate the following islands near the South American coast: Falkland, Tierra del Fuego, Juan Fernandez.

12. Counting 69 miles to a degree of latitude, how far do the Andes Mountains extend north and south? 13. Locate the following volcanic peaks: Chimborazo, Cotopaxi, Aconcagua.

14. What countries are partly drained by the Amazon and its tributaries? 15. Using the scale of miles, find the shortest distance from the headwaters of the Amazon to the Pacific coast. 16. Locate Manaos and Para (Brazil). 17. Trace the course of the Orinoco and locate its delta. 18. What is the latitude of the mouth of the Amazon? 19. Trace the course of the following tributaries of the Plata river system: the Uruguay, the Parana, the Paraguay, and the Pilcomayo.

20. Locate the capitals of countries bordering on the Atlantic Ocean. 21. Locate Punta Arenas, and the capitals of all the countries that border the Pacific coast.

PHYSICAL FEATURES

309. Position.—Only a small part of South America is in the Northern Hemisphere, although seven countries lie entirely or partly north of the equator. Cape Horn, at the southern end of South America, is no farther from the Equator than the southern parts of Hudson Bay, hence South America has no cold polar region like that of North America. Its cold climates are found only in the higher parts of the Andes. Punta Arenas (Fig. 325) is the most southern city of the continent. It is about the same distance south of the Equator that London, in the heart of the North Temperate Zone, is north of the Equator.

South America is farther east than most of North America. The western parts of Ecuador and Peru are in about the same longitude

Fig. 326
Physical
SOUTH AMERICA

as southern Florida and Lake Erie. If we look at a globe or at a map of the world (Fig. 350), we see that the Atlantic Ocean between South America and Africa is comparatively narrow.

310. Size.—South America is smaller than North America, but it is nearly twice as large as Europe. It has, however, only about 65,000,000 people, while North America has about 150,000,000. Europe, although so much smaller, has about seven times as many people as South America. South America has much rich soil, and when its lands are improved, can support several times its present population. Except in Argentina, most of the people live near the borders of the continent.

Brazil is larger than the main part of the United States, and Argentina is one third as large. We sometimes think of Peru and Bolivia as small countries, but each of them is about one seventh as large as the United States.

311. Surface.—The Andes Mountains are narrower and higher than the Cordilleras of our own continent. In their central part, however, the Andes are broad and consist of parallel ranges, with high mountain valleys and plateaus. The largest of these plateaus is that of Bolivia (Fig. 326). Several countries extend from the Pacific coast across the Andes to the lowlands and forests on the east of the mountains. Eastern Colombia is in the basins of the Orinoco and Amazon, and eastern Ecuador is in the Amazon basin. In central Peru branches of the Amazon flow 500 miles in a northerly direction, and then turn eastward into Brazil. Central and northern Bolivia is in the basin of the Madeira, a branch of the Amazon. The crest of the Andes forms a national boundary between Chile and Argentina only.

The higher peaks of the Andes rise to altitudes of more than 20,000 feet. Even at the Equator and for hundreds of miles through the Torrid Zone, the tops of the range are in a region of perpetual snow, with numerous glaciers. The lowlands near the coast are hot, the middle heights are temperate, and the upper slopes are frigid, in climate. Several of the highest peaks are volcanoes. Among these are Chimborazo and Cotopaxi in Ecuador, each rising about 20,000 feet above the sea. Aconcagua, in Argentina, rises about 23,000 feet and is the highest mountain in the Western Hemisphere.

Along the Atlantic Ocean in eastern Brazil are mountains which are much lower than the Andes. Many of them have rolling summits covered with a dense forest growth similar to that of the Appalachians in the United States. North of the Amazon is an elevated region called the Guiana Highlands.

Between the Andes on the west and the Brazilian mountains and Guiana Highlands on the east are broad plains, which extend from the mouth of the Orinoco to the southern part of the continent. South America, therefore, like North America, has mountains in the east and in the west, and central lowlands reaching from the northern part of the continent to the southern.

312. Drainage.—The greater part of the central plain lies in the basins of the three great rivers of South America. The northernmost of these is the Orinoco, which has its sources in the Andes and drains much of Colombia and most of Venezuela. It is in a region of heavy rainfall. In consequence its volume is very great, and out of the land waste carried by its waters it has built a large delta opposite the island of Trinidad.

The Amazon is the largest river in the world. The Missouri-Mississippi is longer, but drains less territory and has far less water. The greatest length of the Amazon is about 3500 miles. Ocean ships can ascend the river more than 2000 miles, and smaller steamers can go hundreds of miles farther. At Tabatinga, 2000 miles from its mouth, the Amazon is $1\frac{1}{2}$ miles wide. At the entrance of the Madeira, several hundred miles from

the sea, it is 3 miles wide, and for more than 200 miles it is 50 miles wide. In times of high water vast areas of the Amazon forest are flooded, and many trees stand in deep water. The natives then move to higher ground, or live for a time in boats. The river pours so much water into the Atlantic that the ocean waters are made muddy far out of sight of land.

The third great river system is that of the Plata River. Its northern streams, the Parana and Paraguay, reach into the heart of the continent and are vast rivers in themselves. They drain much of Brazil and Bolivia, all of Paraguay, and northern Argentina. South of the Plata the plains east of the Andes are drained by several shorter rivers.

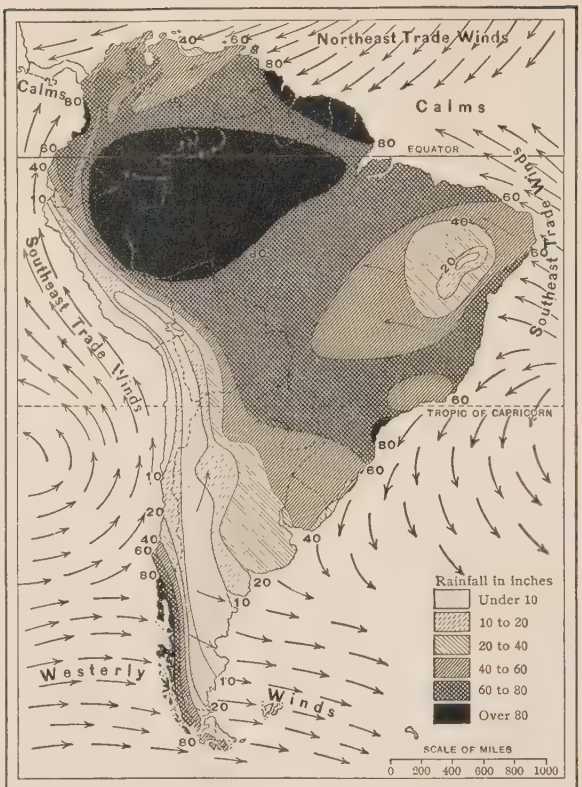

Fig. 327. Annual rainfall and winds in South America

313. Coast Line.—The mouths of the Amazon and Plata are like wide, deep bays, and Lake Maracaibo in Venezuela is really an arm of the sea. As a whole, however, the coast of South America is much less broken than that of North America, and therefore has several thousand miles less of coast line. This condition is not favorable to the growth of coast cities. Several important cities of the west coast have harbors that need to be greatly improved to afford protection for ships in time of storm. Only the coasts of southern Chile and of Tierra del Fuego have headlands and fiords similar to those of Alaska and Labrador. Such coasts furnish excellent harbors, but in South America that part of the continent has so few inhabitants that the harbors are of no practical value.

314. Climate.—The broad part of South America is in the Torrid Zone, where the sun at noon is always nearly overhead; so most of this part of the continent is hot throughout the year. The southern parts of South America are in the Temperate Zone, but they are narrow and are warmed in the winter by winds from the ocean. The continent as a whole is much warmer than North America.

The winds in the broad northern part of South America blow from the Atlantic Ocean—from the northeast in the north and from the southeast farther south (Fig. 327). As these *trade winds* reach the land, and as they cross the Guiana and Brazilian highlands, they are cooled by rising to higher altitudes, and heavy rainfall results. West of these highlands the winds descend, are warmed, and the rainfall diminishes. Here are the comparatively dry grassy plains called the *llanos* in Venezuela and the *campos* in Brazil. Still farther west the trade winds are cooled as they rise on the eastern slopes of the Andes, and the rainfall again is heavy, as it is also near the Equator where the trade winds meet.

On the west there is ample rain along the coasts of Colombia and Ecuador, but the lower slopes and coast plains of western Peru and northern Chile are a desert. The air of the trade winds has lost its moisture, and

as it descends the west slope of the Andes, it becomes warmer and is able to receive moisture instead of giving it off. This strip of lowland is one of the driest parts of the world, and in some places several years elapse between rains.

In the southern part of the continent, however, the Pacific coast has much rain, and the dry lands are east of the Andes, stretching several hundred miles, from central to southern Argentina. In these latitudes the prevailing winds are from the northwest. In southern Chile the cooling of the air due to the increase of elevation, and the rainfall, are therefore in the west. The eastern mountain slope and the plains to the east of the mountains are much drier. It is on account of the difference in the direction of the prevailing winds that northeastern Argentina is wet, while western and southern Argentina are dry.

Between the belt of northeast trade winds in northern South America, and the belt of southeast trade winds in central South America, is a belt of calms, heat, and abundant rain. In our summer time this rain belt is some distance north of the Equator. In our winter it has moved to the south of the Equator. Consequently in the llanos and campos of the interior, and on the west coast of Colombia and Ecuador, the year is divided into a rainy season and a dry season. The northward and southward movement of this rain belt also explains why some parts of South America near the Equator have two rainy seasons and two dry seasons each year.

Review.—1. What parts of the United States are in the same longitude as Ecuador? 2. Compare South America with North America and Europe in size and population.

3. What countries are partly drained by the Amazon and its branches? 4. Give the names and location of three volcanic peaks. 5. Give location and other facts about Tabatinga.

6. Compare the temperature of North America with that of South America and give reasons for the difference. 7. What part of South America is swept by the northeast trade winds? By the southeast trade winds? 8. What parts of South America are very dry? Why? 9. Where are the regions that have two wet and two dry seasons?

PLANTS AND ANIMALS

315. Forests and Grasslands.—Where the temperature is high and the rainfall large, dense tropical forests grow. This is especially true in the central parts of the Amazon basin. Since the eastern highlands of the Guianas and Brazil are in the trade wind belt, they also are moist and covered with forests. The same is true of the eastern slopes of the northern Andes. Because of the prevailing westerly winds, the western parts of central and southern Chile also have a heavy growth of trees. In the Amazon basin the rainfall is heavy and the slope of the land so gentle that the water drains into the streams very slowly. Here is one of the most luxuriant of all tropical forests (Fig. 328), and the large trees, the undergrowth, and the vines make a network of plant life so dense that the explorer must cut a path before he can make his way through the forest.

The llanos of Venezuela, the pampas of Argentina, and a part of the campos of Brazil,

Fig. 328. Forest along the Amazon River

are grasslands in regions of moderate or small rainfall, as are the prairies and western plains of the United States.

316. Animals.—Many of the native animals of South America are very different from those found in other parts of the world. This is partly due to the fact that the position of South America is such that the animals of other continents could not easily reach it. The continent is joined to North America by the narrow Isthmus of Panama. Oceans separate it from all the other continents, and there are few islands in the neighboring waters.

Fig. 329. Jaguar

In western South America is found the llama, an animal somewhat like a small camel, but without a hump. It has a head like a camel's, a body like that of a sheep, and feet and legs like those of a deer. It was tamed and used by the Indians of the Andes as a domestic animal, and is still used as a beast of burden. The flesh, hides, and wool are useful, so that these animals to a degree take the place of horses, cattle, and sheep. The alpaca is a similar animal, with especially fine wool. The llama and alpaca no longer exist in a wild state, but the vicuña, which is like them, is found wild in some parts of South America.

The tapir is a large animal that is related to the rhinoceros, but does not, like the latter, have a horn on its nose, nor does it grow to be so large. The two animals are alike in habit; they are shy, and wander at night, feeding on plants and bathing in the streams. The jaguar (Fig. 329) is a catlike animal, large and powerful, resembling the tiger of Asia and the leopard of Africa. It ranges from Mexico to the southern part of South America, and feeds on other animals. A strange quadruped is the armadillo, which is covered with a strong bony case or shell. It can run rapidly, however, and has strong claws by which it buries itself in the earth when in danger.

Like other tropical lands, the warm parts of the continent have many poisonous insects and serpents, and many brilliant and strange birds. The condor (Fig. 330) is the largest of birds. When its wings are spread, they measure nine or ten feet from tip to tip. It can kill and eat a sheep, goat, deer, or dog. The condor nests in the high Andes, and its young are nearly two years old before they can fly. The rhea is a large running bird resembling an ostrich. Birds of beautiful plumage and a great variety of brilliantly colored insects are found in the tropical forests, and numerous monkeys climb and chatter in the thick tree tops.

Fig. 330. Condor

Horses, cattle, and sheep have been brought in modern times from other lands to South America. This continent, however, has not furnished other parts of the world with any useful animals.

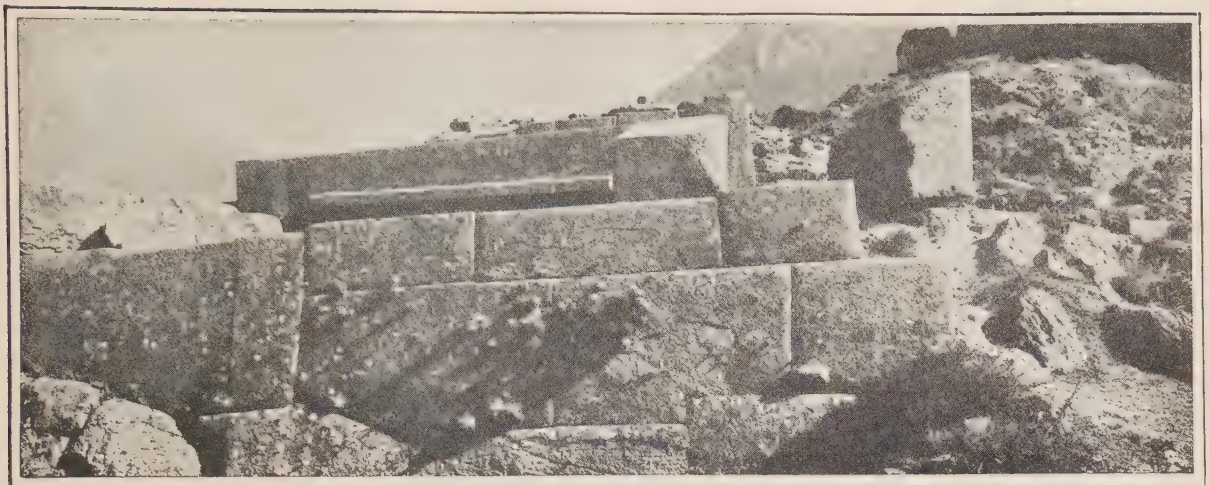

Fig. 331. Ruins of an ancient Peruvian city

PEOPLE AND INDUSTRIES

317. History.—In the years following the first voyage of Columbus, the shores of South America were discovered by him and by other explorers from Spain and Portugal, and thus these two kingdoms gained control of almost the entire continent. They found everywhere, as in North America, native Indian tribes. Some of the Indians were savages, but others had developed many of the arts of civilized people.

The most advanced natives belonged to the empire of the Incas, whose capital was Cuzco, an ancient city among the mountains of Peru. Their dominions covered most of Ecuador and Peru, and parts of Bolivia and Chile. In the course of hundreds of years these people had developed skill in building substantial houses and cities (Fig. 331). They made strong forts and splendid temples, quarrying large blocks of stone and dressing them so that they fitted each other perfectly when laid into a wall. They mined much gold and silver, which they used in adorning their buildings and in making ornaments of many kinds.

The Incas, and the many tribes under their rule, were expert in tilling the soil, and, as much of their land was along the dry western coast, they dug canals and irrigated their fields. They also made terraces on the steep slopes by building walls to hold the soil, and they raised potatoes, corn, and cotton. They found the potatoes and corn as wild plants, developed them by cultivation, and thus gave to the world two of its most important foods. They used the llama as a beast of burden. They built roads and sent messages by swift runners, but they did not have a written language.

The Spanish explorer Pizarro, with a small party of followers, invaded the country in 1532. With the aid of firearms, and by means of treachery, they captured and then killed the king of the Incas, stole their gold, and conquered the land for Spain, under whose rule most of South America remained for nearly three hundred years. Brazil, however, belonged to Portugal, and its conquerors and colonists were from that country.

About one hundred years ago, after several wars, the peoples of South America freed themselves from foreign rule. The Spanish colonies became republics, somewhat like the United States. For many years Brazil was ruled by an emperor, but this country also at last adopted a republican form of government. Only the three Guianas now remain under foreign rule.

318. People.—The people of South America are of many kinds, chiefly Indians (Fig. 332), Spaniards, Portuguese, and mestizos, or mixed races, with some negroes, whose ancestors were brought from Africa as slaves. The negroes are most numerous in Brazil. In later years Englishmen, Germans, Italians, and North Americans have gone to South America, but their numbers are small compared with the Europeans who have found new homes in North America.

Fig. 332. Indians of South America

The Panama Canal facilitates travel and commerce between North and South America. The Inter-Continental Railway also, when constructed, will promote trade among all the countries of both continents.

The republics of North and South America have organized the Pan-American Union, whose object is to promote friendly commercial relations. Its central office is a fine building in Washington (Fig. 333).

319. Products. — In North America the temperate regions are much larger than the tropical. In South America the opposite is true. The southern, or temperate, parts raise wheat and corn, and furnish wool, hides, beef and dairy products. The northern and central countries produce rubber, cabinet woods, dyewoods, quinine, many tropical fruits, coffee, and cacao, from which chocolate is made. Among the most valuable commercial products of tropical South America are coffee and rubber (Secs. 321, 322).

All the countries of the Andes produce silver, gold, and copper. Nitrate, used extensively as a fertilizer, is found in northern Chile; and tin in Bolivia. There is little mining of coal and iron, and for this reason railroad iron, rolling stock, bridge materials, and machinery of all kinds are mainly imported from the United States and other countries.

320. Commerce. — The commerce of South America, which is mainly with the United States and Europe, is rapidly growing. A very large part of the coffee and rubber is taken by the United States, while most of the corn, wheat, flour, meat, and dairy products of Argentina go to Europe, where countries like Great Britain have large populations and not enough farm lands on which to raise their food. A large part of the trade with Europe is with Great Britain, Germany, France, and Italy.

South America is so far east (Sec. 309) that most of the ports of eastern South America are almost as near to the leading ports of Europe as they are to those of the United States. Better ships run between South America and Europe than between South America and North America.

Fig. 333. The home of the Pan-American Union in Washington

Since the completion of the Panama Canal much of the trade of the west coast makes use of that route. European trading nations have sought to gain control of the South American trade; and familiarity with the Spanish, Portuguese, and French languages has given them an advantage. We are now, however, more interested than formerly in South American trade. Our commercial travelers are beginning to learn the languages of the people, and American capital is being invested in South American railroads and mines.

The Panama Canal reduces the sailing distance between New York or New Orleans and the ports of Peru, Chile, and Ecuador by thousands of miles. From Callao to New York by the Cape Horn route is 10,700 miles. By the Panama route the distance is only 3600 miles. Better and swifter ships are being put into service, and trade between the United States and South American nations is steadily increasing.

For a great continent, South America has few railroads, but railroad building has progressed rapidly during recent years. The development of railroads will make it possible to export more of the produce of the plantations, the forests, and the mines.

Review. — 1. Describe the Amazon forest. 2. What are the llanos and pampas, and where are they found? 3. Why has South America some animals peculiar to itself? 4. Describe the llama, the tapir, the armadillo, the condor, and the rhea.

5. Give an account of the Incas. 6. To what nationalities do the South American people belong? 7. What is the Pan-American Union?

8. What are the most important tropical products of South America? 9. What part of South America is best supplied with minerals?

10. What countries have a large trade with South America? 11. How much does the Panama Canal shorten the sailing distance between New York and Callao?

COFFEE AND RUBBER

321. Coffee.—Coffee, like cotton, is raised in warm countries. The plant is said to have derived its name from Kaffa, in Abyssinia, but it was first extensively cultivated in Arabia, where Mocha (the present Mokha) gave its name to a superior kind of coffee. In 1690 a Dutchman from Holland took some of the plants to the island of Java. Later, coffee plants were carried to the West Indies, to Brazil, and to the Philippine Islands.

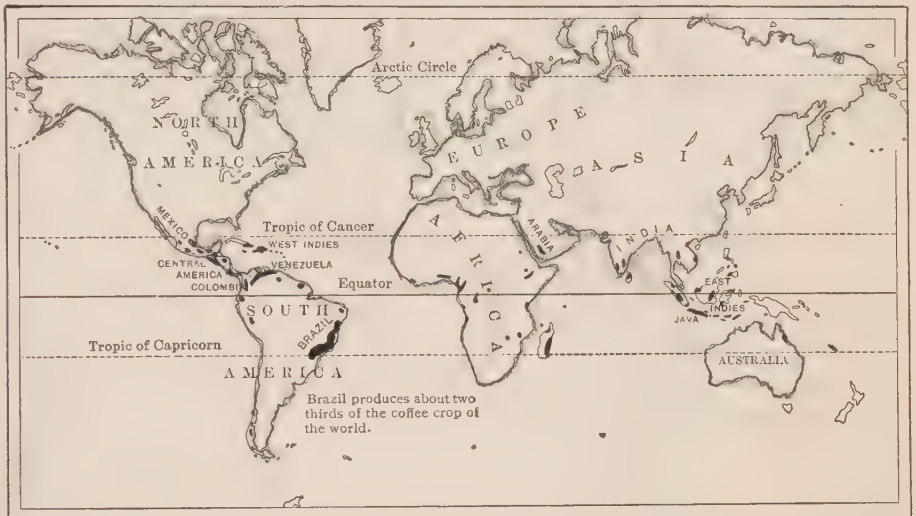

Fig. 334. Coffee-producing regions of the world

Brazil now grows two thirds of the world's supply of coffee, but the crop is important also in Venezuela, Colombia, Central America, Mexico, and the islands of Haiti and Porto Rico. In the Old World coffee is grown in the East Indies, British India, Arabia, and east Africa (Fig. 334). In Brazil most of the coffee is raised in four southern states near the ocean. The principal port is Santos,

Fig. 335. Drying coffee, Brazil. The small railroads serve for carrying the coffee

from which many ships carry the coffee to the countries of the Northern Hemisphere. The United States uses much more coffee than any other country.

The plant grows to a height of from 14 to 18 feet, but when cultivated it is pruned to 6 or 8 feet. Its red berries grow in clusters, and each berry contains two seeds, or coffee "beans," surrounded by pulp and by inner and outer skins. The beans are separated from the pulp by drying (Fig. 335) or by a process in which water is used.

The coffee plant needs high ground, with rich but porous and well-drained soil, some shade when it is young, and plenty of water. Within two hundred years the raising and drinking of coffee have spread to many lands in both hemispheres, like the production and use of potatoes and corn.

322. **Rubber.**—The discoverers of South America found some of the Indians playing with balls made of crude rubber. The Indians also made shoes and bottles of this material. The name *rubber* was finally given to it when an English chemist suggested that it was good for erasing pencil marks; and it was called *India* rubber because the first rubber used in England came from India.

There are many varieties of rubber trees, which flourish best in low, wet ground, and under shade.

Fig. 336. Carrying coffee on board a ship at Santos

The rubber collectors in Brazil cut their way through the dense forest and tap the trees (Fig. 337), which yield a milky juice. This is taken to the camp, and thickened in the smoke and heat of a fire of palm nuts. It is then "crude rubber" (Fig. 338), and is brought down to Manaos in the interior, or to Para, near the mouth of the Amazon. Para is a large city which exports little but rubber.

Fig. 337. Tapping a rubber tree

The United States, Great Britain, France, Canada, and Italy are the countries that lead in the consumption of rubber.

All the tropical countries of South America produce rubber, and much of the crop from Bolivia, Peru, and Ecuador, as well as from Brazil, goes down the Amazon to Para, for export. Central America and southern Mexico are rubber regions, and in the Old World, rubber is produced in the Congo region in Africa, in Ceylon, the East Indies, and Indo-China. Most of the world's supply of rubber is produced from cultivated trees in the oriental countries, especially in the Malay Peninsula and Ceylon, but some rubber plantations have been started in other lands.

The crude rubber is changed by various processes, especially by mixing with sulphur, so that it will stretch when cold and not stick when hot. It is also made into hard rubber, such as is used in combs. Rubber is used for erasers, in garments and footwear, for insulation of electric wires, for hose, dental and surgical goods, mats, cushions, toys, paint, for balls of many kinds, and for carriage and automobile tires. By taking care in tapping the trees and by increasing the number of rubber plantations, the world can always have enough of this important substance.

Review.—1. What country raises the greater part of the world's coffee? 2. What other countries are important in coffee culture? 3. Describe the plant and the coffee berry. 4. What country offers the largest market for coffee?

5. How did the natives of South America make use of rubber? 6. How is the crude rubber obtained? 7. What cities are important in the rubber trade? 8. What South American countries yield rubber? What North American countries? What countries in the Eastern Hemisphere? 9. Name some of the uses of rubber. 10. What countries use most of it? 11. How can the supply of rubber be maintained?

Fig. 338. Making crude rubber by smoking rubber sap

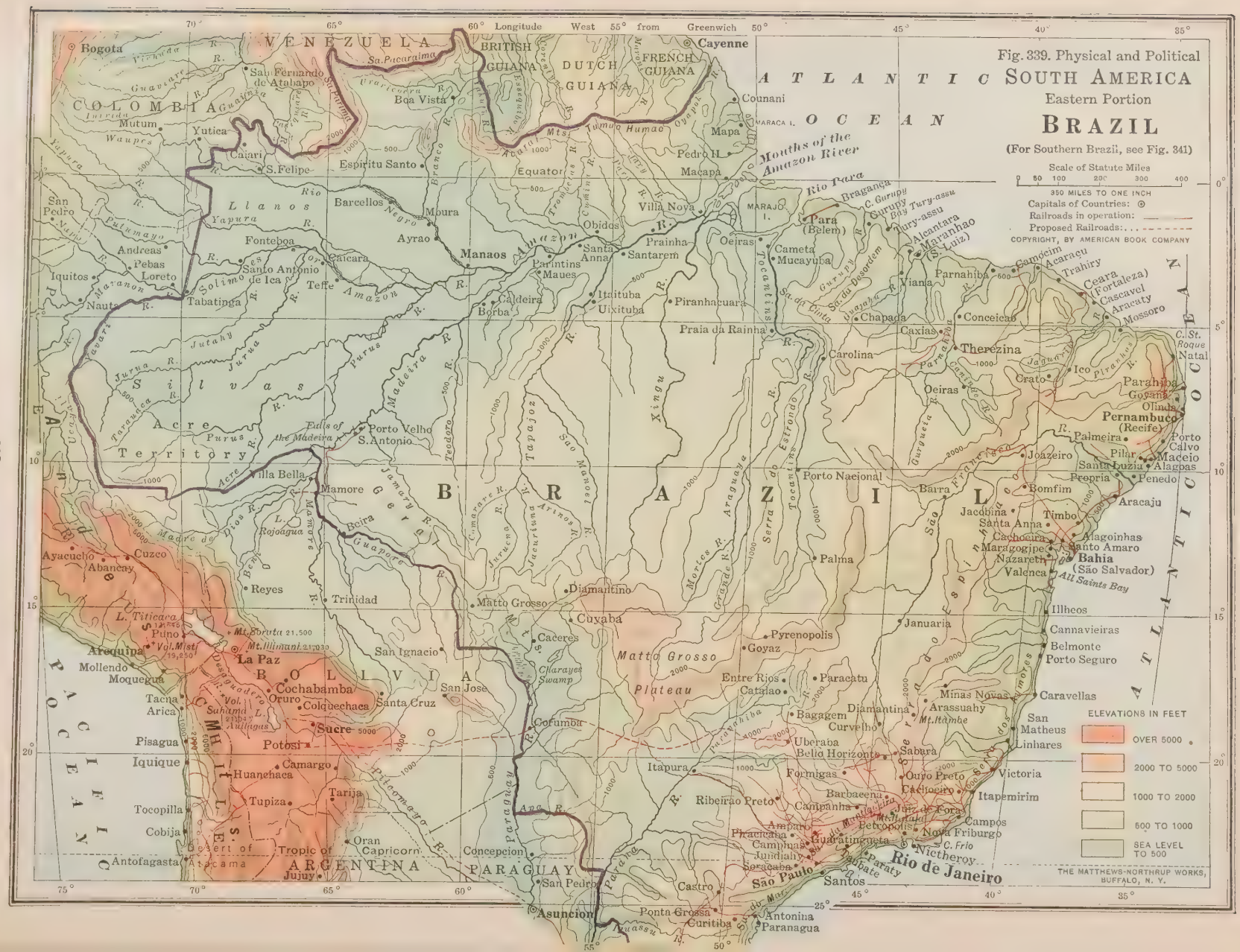
Fig. 339. Physical and Political
ATLANTIC SOUTH AMERICA
Eastern Portion
BRAZIL
(For Southern Brazil, see Fig. 341)
Scale of Statute Miles
0 50 100 200 300 400
350 MILES TO ONE INCH
Capitals of Countries: ⊙
Railroads in operation:
Proposed Railroads:
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Longitude West from Greenwich
VENEZUELA
COLOMBIA
BRITISH GUIANA
DUTCH GUIANA
FRENCH GUIANA
ATLANTIC OCEAN
Mouths of the Amazon River
BRAZIL
PACIFIC OCEAN
BOLIVIA
PARAGUAY
ARGENTINA
Bogota
Cayenne
Counani
Mapa
Macapa
Pedro II
Villa Nova
Obidos
Santa Anna
Santarem
Prainha
Oeiras
Cameta
Mucayuba
Para (Belem)
Braganca
Alcantara
Maranhao (S. Luiz)
Parnahiba
Camocim
Acaracu
Trahiry
Ceara (Fortaleza)
Cascavel
Aracaty
Mossoro
Conceicao
Chapada
Caxias
Therezina
Carolina
Praia da Rainha
Piranhacuara
Itaituba
Uixituba
Caldeira
Borba
Manaos
Parintins
Maues
Ayrao
Barcellos
Moura
Fonteboa
Caicara
Santo Antonio de Ica
Teffe
Tabatinga
Iquitos
Nauta
Loreto
Pebas
Andreas
San Pedro
Rio Negro
Solimoes
Amazon
Yapura
Japura
Caiari
S. Felipe
Espiritu Santo
Boa Vista
Sao Fernando de Atabapo
Mutum
Yutica
Equator
Tumuc Humac Mts
Acaraii Mts
Trombetas R.
Curuahe R.
Jary R.
Oyapok R.
Rio Para
Tury-assu Bay
Gurupy
C. Gurupy
Sa. do Cinta
Sa. Desordem
Tocantins R.
Jaguaha R.
Parnahyba R.
Viana
Ico
Crato
Natal
C. St. Roque
Parahyba
Goyana
Olinda
Pernambuco (Recife)
Palmeira
Joazeiro
Pilar
Porto Calvo
Maceio
Alagoas
Santa Luzia
Penedo
Propria
Aracaju
Bomfim
Barra
Jacobina
Timbo
Santa Anna
Cachoeira
Alagoinhas
Maragogipe
Santo Amaro
Nazareth
Bahia (São Salvador)
Valenca
All Saints Bay
Illheos
Cannavieiras
Belmonte
Porto Seguro
Caravellas
Minas Novas
Arassuahy
Mt. Itambe
San Matheus
Linhares
Victoria
Ouro Preto
Caethociro
Itapemirim
Sabara
Bello Horizonte
Uberaba
Curvello
Diamantina
Bagagem
Formigas
Barbacena
Campanha
Ribeirao Preto
Itapura
Jatahy
Paranahiba
Rio Grande
Araguaya
Morres R.
Crixas R.
Serra do Estrondo
Serra do Tocantins
Xingu
Tapajoz
Madeira R.
Purus
Jutahy
Jurua
Javari
Tarauaca
Acre
Territory of Acre
Silvas
Porto Velho
S. Antonio
Falls of the Madeira R.
Villa Bella
Mamore
Guapore
Beni
Madre de Dios R.
Rio Negro
Rio Branco
Rio Trombetas
Rio Curuahe
Rio Jary
Rio Oyapok
Rio Tocantins
Rio Araguaya
Rio Grande
Rio Paranahyba
Rio Sao Francisco
Rio Sao Manoel
Rio Jacuriuna
Rio Arinos
Rio Jamary
Rio Jaruena
Rio Cuyaba
Rio Paraguay
Rio Apa
Rio Pilcomayo
Rio Pilaya
Rio Desaguadero
Rio Mulatos
Rio Suhuma
Rio Aullagas
Rio Pitamarca
Rio Mamore
Rio Beni
Rio Madre de Dios
Rio Acre
Rio Purus
Rio Jurua
Rio Jutahy
Rio Javari
Rio Tarauaca
Rio Ucayali
Rio Maranon
Rio Pastaza
Rio Napo
Rio Putumayo
Rio Yapura
Rio Japura
Rio Guaviare
Rio Inirida
Rio Guainia
Rio Casiquiare
Rio Orinoco
Rio Uraricuera
Rio Sa. Pucaraima
Rio Mucajahy
Rio Tacutu
Rio Surumu
Rio Cotingo
Rio Maracu
Rio Uatuma
Rio Jatapu
Rio Nhamunda
Rio Trombetas
Rio Curuahe
Rio Jary
Rio Oyapok
Rio Tocantins
Rio Araguaya
Rio Grande
Rio Paranahyba
Rio Sao Francisco
Rio Sao Manoel
Rio Jacuriuna
Rio Arinos
Rio Jamary
Rio Jaruena
Rio Cuyaba
Rio Paraguay
Rio Apa
Rio Pilcomayo
Rio Pilaya
Rio Desaguadero
Rio Mulatos
Rio Suhuma
Rio Aullagas
Rio Pitamarca
Rio Mamore
Rio Beni
Rio Madre de Dios
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Rio Purus
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Rio Ucayali
Rio Maranon
Rio Pastaza
Rio Napo
Rio Putumayo
Rio Yapura
Rio Japura
Rio Guaviare
Rio Inirida
Rio Guainia
Rio Casiquiare
Rio Orinoco
Rio Uraricuera
Rio Sa. Pucaraima
Rio Mucajahy
Rio Tacutu
Rio Surumu
Rio Cotingo
Rio Maracu
Rio Uatuma
Rio Jatapu
Rio Nhamunda
Matto Grosso Plateau
Chiquitos Mts
Charayes Swamp
Mt. Roraima 21,500
Mt. Illimani 21,000
Mt. Sorata 21,500
Vol. Misti 19,250
L. Titicaca 12,846
L. Rojoagua
Lagoa Mirim
Lagoa dos Patos
Rio Grande do Sul
Sa. do Mar
Sa. Geral
Sa. Mantiqueira
Sa. Espinhaco
Sa.

BRAZIL

323. Description of Brazil. — Brazil is more than five sixths as large as Europe, but Europe has nearly fifteen times as many people as Brazil. In Brazil there are on an average only nine or ten persons for each square mile. Portuguese is the chief language of the country. Most of the people live near the coast or in a few of the southern states, and much of the interior is almost uninhabited.

Nearly all of Brazil is within the tropics, where the coldest and warmest months of the year differ in temperature only 5° or 10°. The country extends to about 33° south latitude, however, and in the southern states frosts are common in winter, and there are occasional snowstorms.

Northern and western Brazil are drained by the Amazon and its tributaries, and much of southern Brazil by the Plata system, while southern and eastern Brazil have many streams that do not unite in a single system but reach the sea independently. Of these the São Francisco is the largest.

South of the Amazon plain, the campos occupy the greater part of the country. They are rolling plains, in some places bearing grasses only, in others scrubby trees, and in a few places dense forests.

324. Products. — The forests along the Amazon and on the higher lands have a great variety of woods. As many as two hundred kinds were shown in an exposition at Rio de Janeiro. It is from the Brazil wood, which affords a red dye, that the country gets its name. Of other forest products rubber is the most important, and in addition there are cacao, vanilla, sarsaparilla, various dyes, and Brazil nuts.

Cacao seeds, exported in large quantities to the United States, Great Britain, and other countries, are the material from which chocolate and cocoa are made. Many cacao trees grow in the Amazon Valley and along the coast (Fig. 597). They require shade, and much warmth and moisture. The largest crop is grown in regions protected from strong winds, because the seed pods are large and are easily broken off the trunk and main branches to which they are attached. In the production of cacao Brazil outranks all other countries except the Gold Coast of Africa.

Fig. 340. Rio de Janeiro

In southern Brazil and in Paraguay are ilex trees, whose leaves make maté, or Paraguay tea. It is prepared like ordinary tea, and is a stimulating drink, though hardly suited to our taste. Maté leaves are exported to Argentina, Chile, and Peru.

In the grasslands of central and southern Brazil the cattle industries are important, and hides and meat are exported. German and Italian settlers have introduced modern methods of agriculture, and have established cotton and other manufactures.

Among the agricultural products of Brazil are coffee, corn, manioc, cotton, and sugar. Manioc is grown for its roots, from which farina and tapioca are made. From these roots the natives prepare a flour from which they make a sweetish kind of bread. The juice of some manioc plants is poisonous, and must be carefully pressed out when the roots are ground to make the flour. Coffee is the largest export, and sugar ranks second.

325. Cities.—There are few large cities, and most of them are on the Atlantic coast. The greatest of them is Rio de Janeiro, the capital (Fig. 340). It is the second in size of

65° Longitude West 60° from Greenwich 55°
PERU
BOLIVIA
PARAGUAY
URUGUAY
BRAZIL
Puno
Arequipa
Vol. Misti
La Paz
Mollendo
Moquegua
Cochabamba
Oruro
Tacna
Arica
Sahama
Vol. Aullagas
Colquechaca
Sucre
Pisagua
Potosí
Iquique
Camargo
Huanchaca
Tupiza
Tarija
Tocopilla
Cobija
Tropic of Capricorn
Antofagasta
San Antonio de los Cobres
Jujuy
Salta
Taltal
Tucuman
Copiapo
Vol. Copiapo
Santiago del Estero
Catamarca
Vallenar
La Serena
Rioja
Coquimbo
Ovalle
San Juan
Cordoba
Esperanza
Santa Fe
Concordia
Salto
Parana
Paysandu
Bage
Pelotas
San Felipe
Quillota
Mt. Aconcagua
Mendoza
San Luis
Rio Cuarto
Rosario
San Nicolas
Salto
Valparaiso
Santiago
Rancagua
Rengo
San Fernando
Buenos Aires
Chivilcoy
Bragado
La Plata
Montevideo
Talca
Curico
Constitucion
Cauquenes
Linares
Talcahuano
San Carlos
Concepcion
Chillan
Los Angeles
Lebu
Angol
Traiguen
Temuco
Mulchen
Chosmalal
General Acha
Saladillo
Dolores
Azul
Pandil
Bahia Blanca
Mar del Plata
C. Corrientes
Blanca Bay
Valdivia
Union
Osorno
L. Nahuel Huapi
Puerto Montt
Viedma
San Matias Gulf
Ancud
Castro
CHILOE I.
Valdez Peninsula
Puerto Madryn
Rawson
Chubut R.
CHONOS ARCHIPELAGO
L. Buenos Aires
St. George Bay
Taytao Peninsula
Gulf of Penas
C. Blanco
Puerto Deseado
CAMPANA I.
L. San Martin
WELLINGTON I.
L. Viedma
Santa Cruz
L. Argentino
HANOVER I.
FALKLAND IS. (British)
Stanley
WEST I.
EAST I.
QUEEN ADELAIDE ARCHIPELAGO
C. Virgin
Strait of Magellan
DESOLATION I.
Punta Arenas
SANTA INES I.
TIERRA DEL FUEGO
CLARENCE I.
Ushuaia
C. San Diego
STATEN I.
NAVARIN I.
HOSTE I.
WOLLASTON I.
Cape Horn
SOUTH GEORGIA
Caceres
San Ignacio
San Jose
Santa Cruz
Corumba
Charayes Swamp
Matto Grosso Plateau
Pyrenopolis
Goyaz
Entre Rios
Catalao
Paracatu
Bagagem
Uberaba
Itapura
Formigas
Ribeirao Preto
Campanha
Amparo
Piracicaba
Campinas
Jundiahy
Taubaté
Soracaba
São Paulo
Santos
Castro
Ponta Grossa
Curityba
Antonina
Paranagua
S. Francisco
Joinville
Itajahy
Blumenau
SANTA CATHARINA I.
Florianopolis
Laguna
Asuncion
Villa Rica
Formosa
Caazapa
Villa Pilar
Resistencia
Corrientes
Posadas
Concepcion
San Pedro
Guayra Falls
Iguassu
Victoria Falls
Tarija
Oran
Tupiza
Pilcomayo R.
Bermejo R.
Salado R.
Paraguay R.
Parana R.
Uruguay R.
Apa R.
Urugayana
Rio Pardo
São Leopoldo
Porto Alegre
Livramento
L. Patos
Rio Grande do Sul
Jaguarao
L. Mirim
Melo
Mercedes
Durazno
San Jose
Florida
Minas
Rocha
Plata R.
Colorado R.
Rio Negro
Chubut R.
Andes Mts.
Pacific Ocean
Atlantic Ocean
Fig. 341
Physical and Political
SOUTH AMERICA
Southern Portion
ARGENTINA, CHILE, PARAGUAY, URUGUAY
AND PART OF BRAZIL
Scale of Statute Miles
0 50 100 200 300 400
1 INCH = 350 MILES
Capitals of Countries: ⊙
Railroads in operation:
Proposed Railroads:
ELEVATIONS IN FEET
OVER 5000
2000 TO 5000
1000 TO 2000
500 TO 1000
SEA LEVEL TO 500
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South American cities, and has a splendid harbor. Other busy cities are São Paulo, in the coffee district, and its seaport, Santos (Sec. 321). On the coast between Para and Rio de Janeiro are Pernambuco and Bahia, which export cotton, tobacco, and sugar.

Review.—1. What is the range of temperature over most of Brazil? 2. Why is the southern part of Brazil its coldest region? 3. Describe the campos. 4. What are the chief products of Brazil? 5. What is maté? What countries produce it? 6. Locate the chief seaports of Brazil.

COUNTRIES OF THE PLATA BASIN

326. Argentina.—Argentina is more than 2000 miles long from the border of Bolivia to Tierra del Fuego. On the west it rises to the crest of the Andes, and on the east it is bounded by Paraguay, Brazil, Uruguay, and the Atlantic Ocean. It occupies more than half of the Temperate Zone in South America, and its products are somewhat like those of the United States. The people are very progressive, and Argentina has the largest immigration of all the countries of South America. About one seventh of the population are Italians. Outside of Italy, only our own land has more Italian people than Argentina.

The country is a great plain sloping from the Andes toward the rivers of the Plata system and toward the Atlantic. The central parts of the country around Buenos Aires are known as the *pampas*. They are like the prairies and plains of the Mississippi basin. In the east they are well watered, and raise much grain. In the west they are drier and are used for grazing millions of cattle and sheep.

To the southward are the dry and cool plains of Patagonia (Sec. 314). Northward the country extends within the Torrid Zone, and in the eastern part receives abundant rain from the southeast trade winds. Here are tropical forests, and here also other growths of hot lands abound.

Agriculture and grazing are the great industries of the country. Argentina, like the United States and Canada, raises and exports much wheat. It is sent from Buenos Aires and Rosario, and most of it goes to Great Britain and other European countries to help feed the dense populations of the great manufacturing centers. As the wheat lands of Argentina are more fully occupied and better methods of cultivation adopted, the annual yield may be largely increased. This increased supply will be needed in European markets to take the place of wheat and flour from the United States, more and more of which is being used at home. Argentina also raises corn, and exports more of this grain than any other country. In recent years much corn is being used, as in the United States, for fattening cattle. Argentina has taken first place in raising flaxseed. Grapes and wine are produced on a large scale in the western parts, and sugar cane is grown in the tropical region about Tucuman.

Fig. 342. Hauling grain to market, Argentina

The grassy plains support herds of cattle and flocks of sheep. Beef and mutton are exported in large quantities, the meat being frozen, chilled, salted, or dried. Other cattle products are hides, tallow, and butter. All of these products find a ready sale in European markets, and some of them are now being sent to the United States in large quantities. The beef is needed because our own supply is no longer sufficient for our population, and the hides are needed for use in the manufacture of shoes. Argentina has many sheep, and having a small population, it contributes largely to the world's supply of wool and mutton.

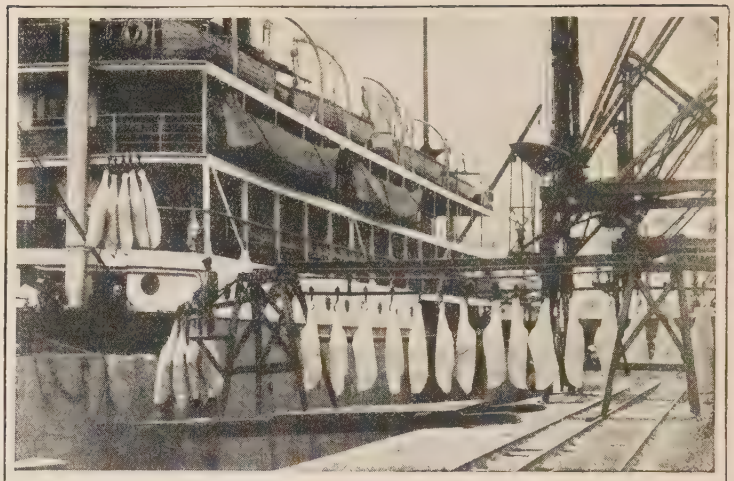

Fig. 343. Loading beef in Argentina

Although there are some textile and paper mills, the chief manufacturing industries are of a very simple kind. They include meat freezing, butter making, flour milling, and brewing. Argentina will probably always be an agricultural rather than a manufacturing country, because there is very little iron or coal to support manufacturing industries. Quebracho wood and its extract, used for tanning, are important exports.

Near Jujuy, in the northern part of the country, there are mines that yield silver, gold, copper, and quicksilver.

Buenos Aires is the capital and has about 1,700,000 people. It is the largest city in the Southern Hemisphere, and the largest city in the world in which Spanish is the prevailing language. It is the chief center of Argentine railroads, and communicates by several lines of steamships with European countries. One of the principal railroads is a trunk line running northward from Buenos Aires to Rosario, Tucuman, and Jujuy. This line extends also beyond the boundary of Bolivia. Another line, the Trans-Andine Railway, runs westward, and by a tunnel crosses the Andes and connects Argentina and Chile. Another railroad extends from the capital about 800 miles to the southwest. One line has 175 miles without a curve.

Many of the ships make " triangular voyages " ; that is, they go from the United States to the Plata River, then to Europe with meat, grain, and wool, and back to the United States. Other vessels sometimes go from Europe to Brazil, take on rubber or coffee, carry these cargoes to the United States, and there load again for European ports. By following these routes the ships are usually sure to get cargoes for the round trip.

327. Uruguay and Paraguay. — Uruguay and Paraguay are small countries east of northern Argentina. They are crossed by the southeast trade winds and have abundant rainfall.

The raising of cattle and sheep is the largest industry of Uruguay. The capital is Montevideo, on the broad mouth of the Plata River.

Paraguay is one of the two South American countries without a seacoast. But it is on the Parana, a great and navigable river, and it is expected that ocean-going steamships will soon be able to call at Asuncion, the capital. Asuncion is now reached by rail from Buenos Aires. Paraguay has large forests of quebracho and other trees, but much of the land is like the campos of Brazil.

Among the chief exports are hides, Paraguay tea, quebracho extract, and oranges, both wild and cultivated. So abundant is the supply of oranges, however, that the greater number are eaten by birds or monkeys or lie on the ground and decay. Tobacco and cotton also are raised. Paraguay women are skillful in the making of lace.

Review.—1. Describe the surface of Argentina. 2. Describe the distribution of rainfall and give reasons.

3. What are the chief products of the farms in Argentina? Why are these exported to European countries? 4. What exports are provided by the grazing industries? To what countries are they sent? Why? 5. What kinds of manufactures are found in Argentina? 6. Give location and other facts about Buenos Aires.

7. Describe three great lines of railroad in Argentina. 8. What is meant by "triangular" voyages of ships that visit the ports of Brazil and Argentina?

9. What is the chief industry of Uruguay? 10. What means of communication with foreign lands has Paraguay?

COUNTRIES OF THE ANDES

328. Chile.—Chile lies on the west slope of the Andes, and the nearness of the mountains to the coast makes the country very narrow. It is, however, more than 2500 miles long (Fig. 341). For several hundred miles along the coast there is a lower range of mountains that shuts off the interior as a valley between itself and the Andes. This Central Valley includes the best soil and the largest centers of population, among which is Santiago, the capital.

The northern part of Chile is within the tropics; the central and southern parts are in the Temperate Zone. For this reason, and because the land varies in altitude from sea level to the summits of the Andes, there is a great variety of climate. The reasons why northern Chile is dry and southern Chile is wet have already been given (Sec. 314).

Chile, like Argentina, is known as a progressive nation. It had the first railroad on the continent, and is now active in three great branches of industry: mining, farming, and manufacture. Of these, mining is the most important, and the most valuable deposits are the beds of nitrate, a substance used in fertilizers and in the manufacture of explosives. The nitrate is found in northern Chile. It is the leading export of the country and an important source of governmental revenue. Chile is also an important producer of copper, and has coal, gold, silver, and other mines.

Agriculture is the second interest in Chile. In the northern dry region irrigation is necessary. In the moist and cooler parts all the grains and fruits commonly produced in temperate latitudes are raised, and some wheat is exported. The cattle and sheep industries also are of considerable importance. Trade with the United States is increasing, and is favored by the opening of the Panama Canal.

Valparaiso is the principal port and is the gateway to the capital, Santiago, a city of about 500,000 people. Iquique, the second port of Chile, is the principal shipping point for the nitrate. Punta Arenas, the most southern city of the world, is on the Strait of Magellan (Fig. 325). It is a *free port*, no duties being collected on exports or imports.

Fig. 344. Packing nitrate in bags, Chile

Fig. 345. Physical and Political

SOUTH AMERICA

Northern and Western Portion

COLOMBIA, VENEZUELA AND THE GUIANAS

ECUADOR, PERU AND BOLIVIA

Scale of Statute Miles

0 50 100 200 300 400

350 MILES TO ONE INCH

Capitals of Countries: ⊙

Railroads in operation: ———

Proposed Railroads: . . .

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329. **Peru.**—Peru has a long shore line, but the country is not so long or narrow as Chile (Fig. 324). It may be divided into three sections: first, a seacoast section west of the Andes; second, a mountain belt, with plateaus and valleys of high altitude and temperate climate; and third, a section on the eastern slope of the Andes, and along the headwaters of the Amazon.

Peru is rich in minerals, especially petroleum, copper, silver, and gold. With good roads and modern methods of mining, Peru will yield more mineral wealth than was ever taken from the mines by the Incas.

Fig. 346. Observatory of Harvard University at Arequipa, Peru

An important vegetable product from the forests of Peru is quinine, the bitter medicine used in cases of fever. It is made from the bark of the cinchona, a tree that grows in Peru, Bolivia, Ecuador, and Colombia. It is also called Peruvian bark. So many trees were killed by stripping the bark, fear arose that the supplies would fail. Hence about sixty years ago trees were transplanted to British India, Java, and other parts of the East. The result is that the world's market is now mainly supplied from India.

Rubber is produced in the forests on the eastern side of the Andes. Although the Pacific ports are relatively near, the route over the Andes is difficult, and most of the Peruvian rubber is sent down the Amazon to Para.

Sugar and cotton, grown in the coastal regions, are, with coffee, wool, hides and skins, the chief agricultural productions. Peruvian cotton has a long woolly fiber, and is therefore in demand among cotton manufacturers for making special kinds of cloth.

Some rubber is produced, also cacao, tobacco, and corn. The sugar industry belongs mainly to the coastal region and ranks first in importance. Excellent rice is grown for home consumption. The leading exports are sugar, cotton, coffee, and petroleum.

Callao is the principal seaport of Peru, and a few miles inland is Lima, the capital. A railroad extends from Callao and Lima to Oroya in the high Andes. Paita is the port for northern Peru, and Mollendo for the southern part. From Mollendo, a railroad has been built across the mountains to Lake Titicaca, on the border of Bolivia. This lake, which has an area of about 4000 square miles, is the largest fresh-water lake in South America. It is nearly two and a half miles above sea level and is the highest navigable lake in the Western Hemisphere.

On the western slope of the Andes, at Arequipa (Fig. 346), Harvard University has an astronomical observatory. The air is very clear. Many stars can be seen there that cannot be observed from the Northern Hemisphere. Arequipa is a market for alpaca and vicuña wools, most of which are sent to New York and Boston in our own country, and to France.

330. **Bolivia.**—Bolivia was named after General Bolivar, the liberator of the northwestern parts of the continent. Like Paraguay, it has no seacoast. In the west it is a land of high plateaus among the Andes ranges, and in the north and east less elevated regions drain to the Amazon and Plata. In the highlands silver and gold are mined. Tin ore is now the chief product and, with the silver and gold, is largely exported. Rubber and coca are products of the eastern forests.

Fig. 347. Part of La Paz, Bolivia

Although at a distance from the sea (Fig. 345), Bolivia has several ways of reaching it. Three railroads now reach the coast, one of these leading to Mollendo in Peru, another to the port of Antofagasta in Chile, and the third from La Paz to Arica. Another railroad extends through Argentina to Buenos Aires. Steamboats go down the waters of the Amazon system from Bolivia to Para on the Atlantic. Ships also go from Bolivia by way of the Parana system to Buenos Aires. The total length of navigable rivers in Bolivia is 12,000 miles. The capital and chief city is La Paz (Fig. 347). Potosi is the center of the silver-mining district.

331. **Ecuador.**—Ecuador is so named because it is on the Equator. It is much like Peru in its surface and products, but differs from Peru in having a well-watered coastal lowland (Sec. 314). Both the eastern and the western mountain slopes are forest covered to a height of 5000 feet.

The principal port is Guayaquil. The capital, Quito (Fig. 348), is far up among the mountains. A railway from Guayaquil to Quito was finished in 1908. Ecuador has deposits of copper, iron, lead, and coal. Cacao, from which chocolate is made, ivory nuts, and coffee are the chief agricultural products. Many Panama hats are woven in Ecuador and in northern Peru. About Quito are Cotopaxi and other lofty volcanic peaks. Earthquakes are common, and many houses are built low, of timbers and bamboo laths, so that they may not be shaken down.

Review.—1. Describe the climate of northern Chile; of southern Chile. 2. What is the Central Valley? 3. What is the greatest mineral product of Chile? 4. Name and locate the capital; the chief seaport.

5. What three regions has Peru? 6. What are the chief ports of Peru? 7. Give an account of quinine. 8. Give two important facts about Arequipa.

9. What is the most important mineral product of Bolivia? 10. Describe the surface of Bolivia. 11. By what routes does Bolivia communicate with the outside world?

12. How does the coastal part of Ecuador differ from that of Peru? 13. Name and locate the capital and the chief port of Ecuador. 14. What is the leading product of Ecuador?

COUNTRIES OF THE NORTH COAST

332. **Colombia.**—Colombia borders the Pacific Ocean and the Caribbean Sea, and its chief port is Barranquilla, on the north shore, at the mouth of the Magdalena River. There are three ranges of the Andes in western

Fig. 348. Market place, Quito, Ecuador

Colombia, and the Magdalena and Cauca rivers flow northward in the intervening valleys. The eastern part of Colombia drains into the Orinoco and Amazon rivers, and belongs largely to the llanos, which continue eastward over much of Venezuela.

In the valleys and coastal lowlands many tropical products are raised, and on the higher grounds the fruits and grains of temperate regions flourish. The country abounds in minerals and rivals Russia in platinum.

Bogota is the largest city and the capital of Colombia. It is far in the interior and is more than 8000 feet above the level of the sea. It has street railroads and electric lights similar to those of a modern American city.

333. Venezuela. — Most of Venezuela is in the basin of the Orinoco River. There are low mountains in the south, and a range of the Andes in the northwest. Half the country is covered with forest. The products are similar to those of Colombia. The chief exports are coffee, cacao, and hides.

Caracas is the capital of Venezuela (Fig. 349), and although but a few miles from the Caribbean Sea, it is several thousand feet above the sea level. A narrow-gauge railroad leads down to La Guaira, the principal seaport. Maracaibo, on the lake or lagoon of the same name, also has large foreign commerce.

334. Guiana.—The Guianas belong to Great Britain, Holland, and France. They are undeveloped countries with a hot, moist climate and much forest. Sugar and molasses, made from sugar cane, are the chief exports. Gold is mined, especially in French Guiana. Georgetown, Paramaribo, and Cayenne are the three capitals.

ISLANDS

335. South American Islands.—The Falkland Islands are a wind-swept group 300 miles east of the Strait of Magellan. They are a crown colony of Great Britain. Some sheep are raised, but the chief use of the colony is as a coaling station for British ships.

Fig. 349. Capitol and National University, Caracas, Venezuela

Tierra del Fuego is an archipelago, whose whole area is about equal to that of the states of New Hampshire and Vermont. There are forests and grasslands, but the land has only a few thousand people. Part of it belongs to Argentina, and part to Chile.

Fringing the coast of southern Chile are many islands, and a few hundred miles to the west is Juan Fernandez, where an English sailor was cast away in the early days and had adventures which suggested the story of "Robinson Crusoe." The Colon Archipelago (Galapagos Islands) is on the Equator seven hundred miles west of Ecuador, to which country it belongs.

Review.—1. Describe the drainage of Colombia. 2. Name and locate the chief seaport. 3. What is the capital and how is it situated?

4. Name and locate the capital and two seaports of Venezuela. 5. What is the chief export?

6. Give the location and other facts concerning the Falkland Islands; Tierra del Fuego; the Colon Archipelago; Juan Fernandez. 7. Compare North and South America as regards islands.

8. Make from memory a map of South America, showing the countries, the chief mountains, the three chief river systems, and twelve or more important cities.

Fig. 350. Th

Map Study.—1. Which is the largest of the oceans? 2. Which has the most islands? 3. What oceans are joined by Bering Strait? 4. What lands border the Indian Ocean?

5. Locate Iceland with reference to the Arctic Circle; with reference to Norway and Greenland. 6. Compare the latitudes of Japan and New Zealand; of Madagascar and the Hawaiian Islands.

7. Through what waters in the Northern Hemisphere may one pass from the Atlantic to the Indian Ocean? 8. Compare the latitudes of the Gulf of Mexico and the Mediterranean Sea. 9. Compare the latitudes of the

emispheres

Cape of Good Hope, Cape Horn, and the island of Tasmania. 10. Compare the latitudes of Bering Sea, the British Isles, and southern Greenland.

11. Compare the longitudes of Cape Race and Cape St. Roque; of Panama and Hudson Bay; of Panama and Cape Mendocino.

12. What seas in the Eastern Hemisphere are crossed by the Tropic of Cancer? What gulf in the Western Hemisphere is crossed by the same line? 13. What island groups of the Pacific Ocean lie near the Tropic of Capricorn? What group is near the Tropic of Cancer?

Fig. 351. Nearly half of this hemisphere is land

Fig. 352. Most of this hemisphere is water

OCEANS, POLAR REGIONS, AND WORLD WINDS

THE OCEAN

336. Oceans and Seas.—Nearly three fourths of the surface of the globe is covered with salt water (Figs. 351, 352). This great body of water, which surrounds the lands, is called *the ocean*, or *the sea*, but five of its larger parts are called *oceans*, and many smaller bodies of salt water, which are connected with the ocean but are more or less landlocked, are called *seas*, *gulfs*, or *bays*. The Mediterranean Sea, Red Sea, and Caribbean Sea, the Persian Gulf, Gulf of Mexico, and Gulf of California, and Hudson Bay and Bay of Bengal are examples.

337. Ocean Basins.—Because the bottom of the ocean is lower than the lands, we often speak of the *ocean basins*. We must, however, remember that the deepest waters extend downward only a few miles, and that oceans are thousands of miles wide. If we could see the earth without any water on its surface, we should discover that the ocean basins are relatively slight depressions.

Around the continents, in most places, the water is shallow, that is, not more than a few hundred feet deep, for many miles from the coast. The shallow sea bottom bordering a continent is called a *continental shelf*. It is shown in the lightest blue tint, almost white, bounded by the 100-fathom (= 600-foot) line in Figures 326, 373, and other physical maps. If the continent and the shelf were to rise six hundred feet, this shelf would become land and be known as a coastal plain. At the outer edge of the shelf the sea bottom slopes down rather steeply until the water is several thousand feet deep, and a few places show depths of five or six miles. The deepest places of the sea measure about the same as the highest mountains, so that the total difference in elevation between the lowest ocean depth and the highest mountain top is nearly twelve miles.

338. Sea Bottoms.—The land surface and the sea bottom are very different in appearance. The land is made rough by the uplifting of mountains, and by the work of rivers, glaciers, and weathering. The ocean bottom, especially within a few hundred miles of the coast, is always receiving a cover of mud and sand that are brought from the land. The smallest of the mud particles are usually carried long distances from the continental border before they finally settle to the sea floor. Myriads of very small shelled animals, as well as fishes and larger sea creatures, live in the ocean; when they die, their remains dissolve and cover the deep sea bottom with fine oozy mud. As a result, the sea floor is mainly a plain, much wider and smoother than any prairie. There are places, however, where ashes and lava have accumulated around volcanic openings in the sea bottom, and some of these accumulations reach the surface, or even extend far above it as mountainous islands.

Many ships have been sent out for the study of the ocean waters, the living things in these waters, and the deposits on the bottom. Soundings of the deepest seas are made, and dredges or scoops bring up the mud and the animals of the sea floor. Many ships have also been sent to survey and map coasts and islands, and record the soundings for the benefit of navigators. The United States government publishes hundreds of maps of various parts of the ocean, especially along its own shores.

339. Coast Islands. — In the ocean are hundreds of thousands of islands. Some are mere islets of rock, some have a few square miles of soil, and some are large; for example, Madagascar, Cuba, and Newfoundland. Some of the islands along the coast of the continents are high and rocky and have been cut away from the mainland or formed by the sinking of a coast land of hills and valleys until the sea water filled the valleys and left the hills as islands. Other coast islands are low and sandy and have been formed in shallow water by waves and winds throwing up mud and sand.

Fig. 353. A volcanic island, in the Hawaiian group

340. Volcanic Islands. — In the open ocean many of the high islands, such as the Fiji and Hawaiian Islands (Fig. 353), have been made by volcanic eruptions. These began at the bottom of the ocean and have piled the materials higher and higher until in some cases they rise thousands of feet above sea level.

341. Coral Islands. — Other islands in the open sea, and in some instances not far from shore, are low and flat, and have been formed by the growth of animals called corals. The living animals have the appearance of flowers and stand fixed in their place. They live in shallow water, and have hard skeletons. The corals that are living, and the skeletons of those that are dead, make up a *coral reef* (Fig. 578). The living corals make the surface of the reef, and below is coral rock, formed mainly from the hard parts of the dead corals.

342. Island Peoples. — Many of the islands are inhabited, the people having come to them from neighboring continents or other islands. The natives of

some of the islands of the Pacific Ocean are descended from people who came from Asia or the East Indies. Their ancestors, at an unknown period of the past, made their way first from the mainland to the neighboring islands and then from island to island in such boats as they were able to make (Fig. 354).

Fig. 354. Boat made by natives of New Guinea

343. The Water of the Ocean.—The rocks in many regions contain salt. The water in the ground is constantly dissolving some of the salt, which is carried by the rivers to the ocean. When water is evaporated from the surface of the ocean, the salt and other dissolved substances are left behind, and ocean water is salt. On some seashores where the climate is dry and hot and the water shallow, salt is formed by the evaporation of the ocean water. Near the mouths of rivers ocean water is partly fresh, and is called *brackish*.

There is much limy material in sea water, due to the dissolving of limestone by ground water. Many other minerals are found in sea water, including even a little gold.

In the tropical regions the surface waters are warm, and they grow cooler toward the Poles. The sea about the North Pole is covered with floe ice formed by the freezing of ocean water. This is from six to twenty feet thick, and masses of it sometimes break away from the southern edge of the ice fields and float hundreds of miles southward in the Atlantic Ocean before melting. Such ice forms also about the Antarctic Continent. In addition, many icebergs, broken from glaciers, are found in the polar seas.

At great depths the water is cold, even near the Equator. This is because cold water is heavier than warm water, and so the cold water of the polar regions pushes slowly along the ocean floor underneath the warmer waters of the temperate and tropical seas. Self-registering thermometers have been let down to great depths, and have shown that the temperatures near the bottom are often but a few degrees above the freezing point.

344. Life in the Ocean.—The ocean is so great, covering three fourths of the earth's surface, that it holds a vast amount of life.

Many food fishes and the common shelled animals, such as oysters and clams, live in shallow water or in the mud near the shore. Some animals, like the corals, thrive only in a beating surf. Barnacles and seaweeds cling to rocks, where they are in the water at high tide and in the air at low tide.

Other forms are found far out from land, swimming at or near the surface of the sea. Still other creatures live in the depths of the ocean, where it is dark and cold, where there is no wave action, no change from day to night, and no change of seasons.

WAVES, CURRENTS, AND TIDES

345. Waves.—Most waves are caused by winds, which stir the surface of the water. Even violent winds do not move the water more than a few hundred feet below the surface. A wave is a moving ridge of water. The top of the wave is called the crest. The depression between two waves is the trough. In a small pond waves may be a few inches high. On a lake a mile or two wide they may be high enough to engulf a small boat. On the ocean, in violent storms,

waves may be thirty or forty feet high, and may make it necessary for large ships to keep their course across the waves in order to pass through the storm safely. Persons on deck, and even parts of the rigging of ships, are often carried away by storm waves.

It is not the water itself, but the wave shape of the water that moves so fast along the surface. Drop a chip on the surface of a pond that is rippled by a strong breeze. The chip will move back and forth and go slowly over the pond, while the wave moves swiftly.

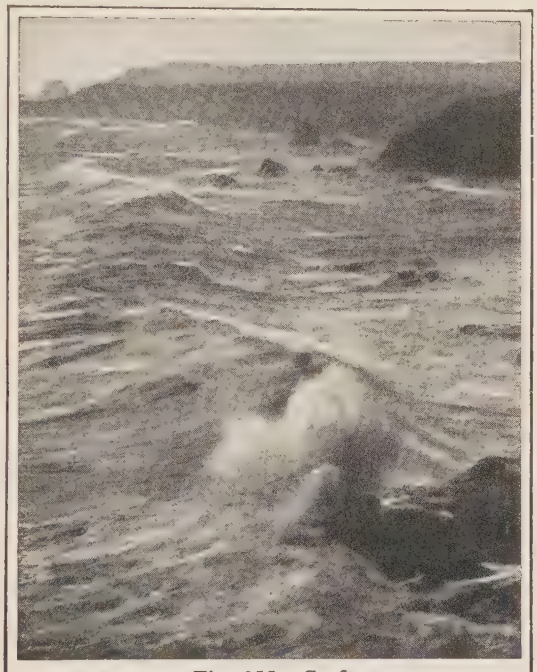

Fig. 355. Surf

346. Surf.—We often see waves close to shore when farther out the water is still or has a gentle swell. A thousand miles out to sea there may be a heavy storm and big waves. Some of the wave motion passes through the more quiet waters outside the storm. Near the shore the water is shallow, and the quiet movement, or swell, makes a wave roll up, turn over, and break at the crest. Therefore we speak of *breakers* or *rollers*. This narrow belt of waves near the shore we call the *surf* (Fig. 355). Where the beach is low and slanting, the water of the breaking waves runs up the beach and back again continually. The water that runs back along the bottom in a strong current under the waves is called the *undertow*.

347. Work of Waves.—The surf waves cast up sand and pebbles and make a gently sloping *beach*. On the borders and around the head of a bay, beaches are usually smooth and beautifully curved. The surf acts like a mill upon the pebbles and sand grains of the bottom. It stirs them, rubs them against one another, and thus grinds them to powder. Storm waves cast these materials up and build ridges at some distance inland from the usual shore line.

Where the waves beat against a steep coast, they wear away the rocks and form a cliff, which may be hundreds of feet high, because in time they may cut far back into the side of the hill or mountain (Fig. 372). Where the waves beat harder at some places than at others, or where the rocks at one point are soft or full of joints, the waves may dig caverns for some distance into the face of the cliff.

Where the sea is shallow for a long way from the shore, a reef or beach may be built at some distance from the land. The waves gather up mud and pebbles which they drop when they break. The new land thus formed is called a *barrier beach*, and the narrow body of shallow water that separates it from the mainland is called a *lagoon*. On some shores, such as that of New Jersey, the barrier beaches extend many miles.

Sailors do not fear great waves on the open sea, where they have sea room, but they are in danger when the ship is so near the shore that it may be driven aground or dashed against the rocks by heavy surf. Great storm waves may rush in upon a city that stands on a low shore and cause much damage,—as at Galveston in 1900, before the city built its sea wall. Earthquakes sometimes start waves which destroy coast towns and even carry ships several miles inland.

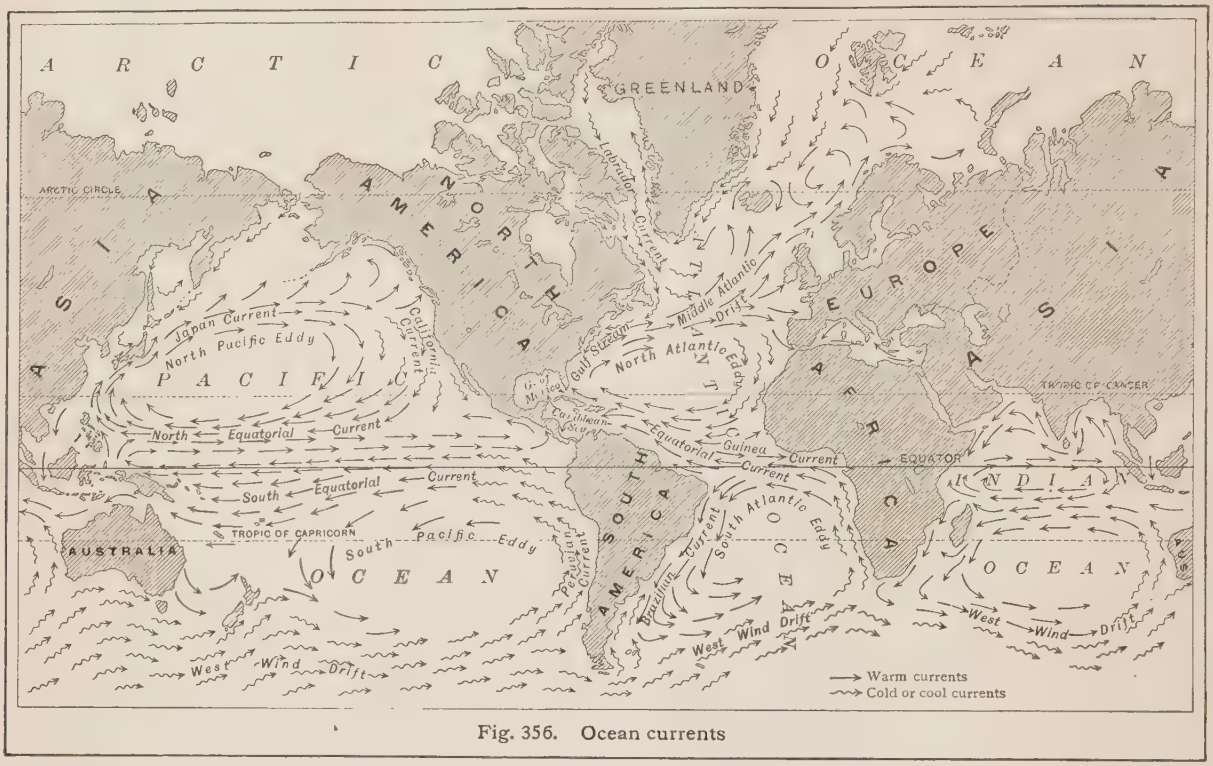

Fig. 356. Ocean currents

348. North Atlantic Ocean Currents. — Along the Equator in the Atlantic Ocean the waters move slowly westward, from west Africa to South America. Along the coast of Brazil they divide, and the northern parts flow among the West Indies and through the Caribbean Sea and the Gulf of Mexico. From the Gulf of Mexico a strong current flows at the rate of four or five miles an hour through the Florida Strait, and bears northeast past the east coast of the United States. This part of the moving water is known as the *Gulf Stream*. It is about 75 miles wide and it is warmer than the water on either side because it comes from the tropics. As the Gulf Stream moves out toward the middle Atlantic it loses its velocity, broadens out, and becomes a slow *drift*. These drifting waters reach western Europe, and some of them go toward Norway, while some go southward past the Iberian Peninsula and join the west-moving equatorial current. Thus we have a complete circuit known as the north Atlantic eddy (Fig. 356), whose waters move from left to right, like the hands of a watch.

There is also an Arctic current whose cold waters come past Greenland, Labrador, and Newfoundland, as far south as New England. Icebergs from the Greenland coast float to the region of Newfoundland or farther south before they melt, and fogs are common in that part of the Atlantic where the warm, moist air of the Gulf Stream belt mingles with the colder air over the Arctic current.

These ocean currents help to make the difference in temperature between the eastern coast of America and the western coast of Europe in the same latitudes (Fig. 590).

349. South Atlantic Currents. — The waters that turn southward along the Brazilian coast swing back to the east and flow northward along the coast of Africa, making a south Atlantic eddy (Fig. 356). In this eddy the waters move from right to left, or counter to the hands of a watch. We thus have two great eddies in the Atlantic Ocean.

350. Pacific Currents.—The Pacific Ocean has two eddies like those of the Atlantic. The western part of the north Pacific eddy is the Japan current. It moves eastward past Alaska, and southward along the western coast of North America. On the west coast of South America the waters move from the Antarctic regions northward and are known as the Peruvian or Humboldt current.

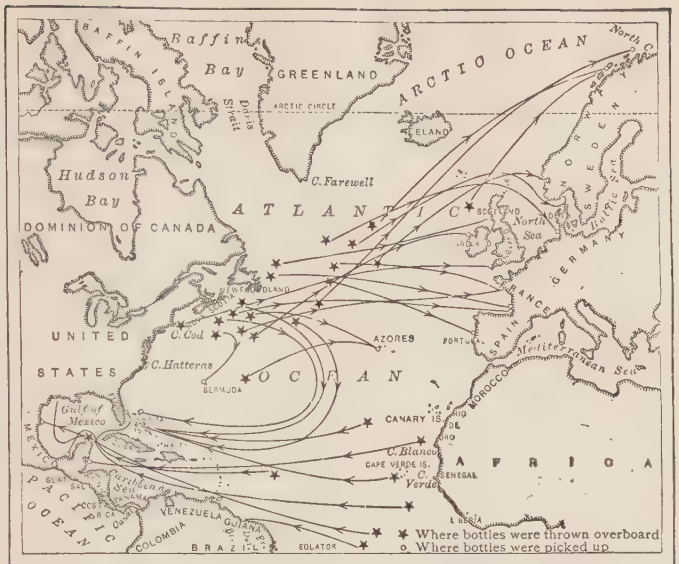

Fig. 357. Currents indicated by drifting bottles

351. The Study of Ocean Currents.—We cannot see the motion of an ocean current, and we learn most about such currents by studying the movements of floating objects. Sealed bottles are thrown out, containing a record of the latitude and longitude at which they are cast into the sea. Some bottles dropped in the western Atlantic have been found on the shores of Norway and Ireland, and others have gone around to the West Indies. Abandoned ships, or derelicts, have been sighted at different times, and it is found that they also drift with the ocean currents.

352. Tides.—On the shores of the ocean, even when no winds are blowing, the water slowly rises and falls. Such movements are called *tides*, and they are due to the low, wide waves known as tidal waves. The two extremes are called high tide and low tide. When the water is falling, we speak of the *ebbing* of the tide. The interval between two successive high tides is 12 hours and 26 minutes.

On a flat shore the ebbing of the tide leaves a broad beach uncovered, and people who wish to bathe may have to go out several rods to reach the water. If the shores are steep, the bottoms of the cliffs may be laid bare. These are frequently covered with barnacles and dark, dripping seaweed, while small pools among the rocks are full of shelled creatures.

Boats are often left high and dry and cannot go out until the tide comes in again. (Figs. 358, 359). Many harbors and the

Fig. 358. Low tide, Digby, Nova Scotia

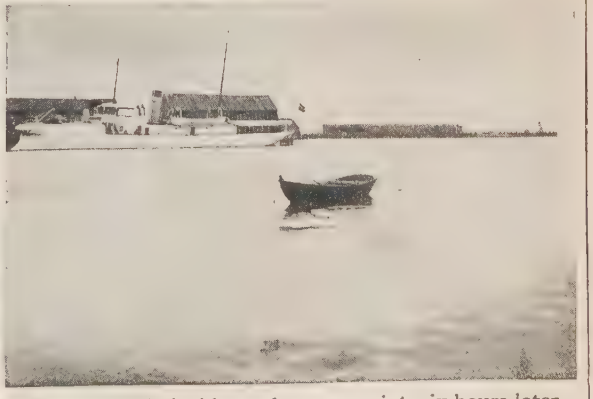
Fig. 359. High tide at the same point, six hours later

Fig. 360

THE WORLD

PRINCIPAL TRANSPORTATION LINES AND COMMERCIAL DEVELOPMENT

channels that lead to them can float large ships only at high tide. For example, large ships must often wait in the Lower Bay at New York for high tide before they can come up to the docks, and must time their sailing by the state of the tides. Tide tables are published so that sailors can always know at what hours they will find deep water in any of the world's great harbors.

Where the shores of a bay or river mouth narrow, the waters of the rising tide are pushed together and roll in rapidly, making a noticeable *tidal current.* A current is also formed when the water of the bay or river mouth falls rapidly at the time of the ebb tide. In thus sweeping in and out, the tides are useful in cleansing the harbors, carrying away sewage and other filth, which if allowed to remain would pollute the waters, causing bad odors and disease.

In some bays, as the Bay of Fundy on the Atlantic coast of Canada, and the Bristol Channel on the west coast of Great Britain, the shores converge for a long distance and the tides rise and fall fifty feet or more. Where the tidal range is so great, wide flats of mud may be exposed at ebb tide. Landing stages or floating piers are sometimes built in harbors. These rise and fall with the tide and are joined to the shore by inclined bridges.

Some rivers are entered by a swift-running tidal wave. It is like a heavy surf, or moving wall of water, and is called a *bore.* Examples are found in the lower Amazon and in the Seine in France.

Tides are very small in seas with narrow entrances, like the Mediterranean, and in the Great Lakes.

353. **Cause of Tides.**—The times of rising and falling tide correspond to positions of the moon, the nearest of the heavenly bodies (Sec. 574). The rising of the water, or the tidal wave, is due to the pull or attraction of the moon. As the earth turns on its axis the wave goes around the world. If the surface were all water, a low, unseen wave, a few feet high and thousands of miles wide, would go around the globe. But because the lands interrupt, the tidal wave pushes up on the shores. Sometimes the moon and the sun are in line with the earth and pull together, and then the tides are a little higher than usual. It is not correct to use the words tidal wave for a large wave due to an earthquake or a storm.

USES OF THE OCEAN

354. **Influence on Temperature and Rainfall.**—It is not a waste for the earth to have so much water instead of forests and fertile fields. We should remember that the oceans receive and hold the heat of the sun, and the currents move far north and south of the Equator. The winters in the temperate and polar regions are much warmer than they would be if the oceans did not stretch so far north and south. It is the ocean also that furnishes the water for rains and snows. Without the ocean, the earth would be a desert, a part of it hot and the rest of it cold, and animals and plants could not live.

355. **Food Supply.**—The ocean also furnishes food. For thousands of years the peoples dwelling by the sea have depended much on fish, and by the help of railroads and canning factories every one, however far inland, can now have sea food.

356. **Highway.**—The ocean is the greatest of highways. A nation that lives by the sea is neighbor to all other nations that live on the ocean border. There are no expenses for keeping the ocean highways in order. When docks and ships are built, men and goods can be carried around the world. Figure 360 shows the most important steamship routes.

357. **History of Navigation.**—In ancient times men learned to row or sail their small boats near the shores. At first they went

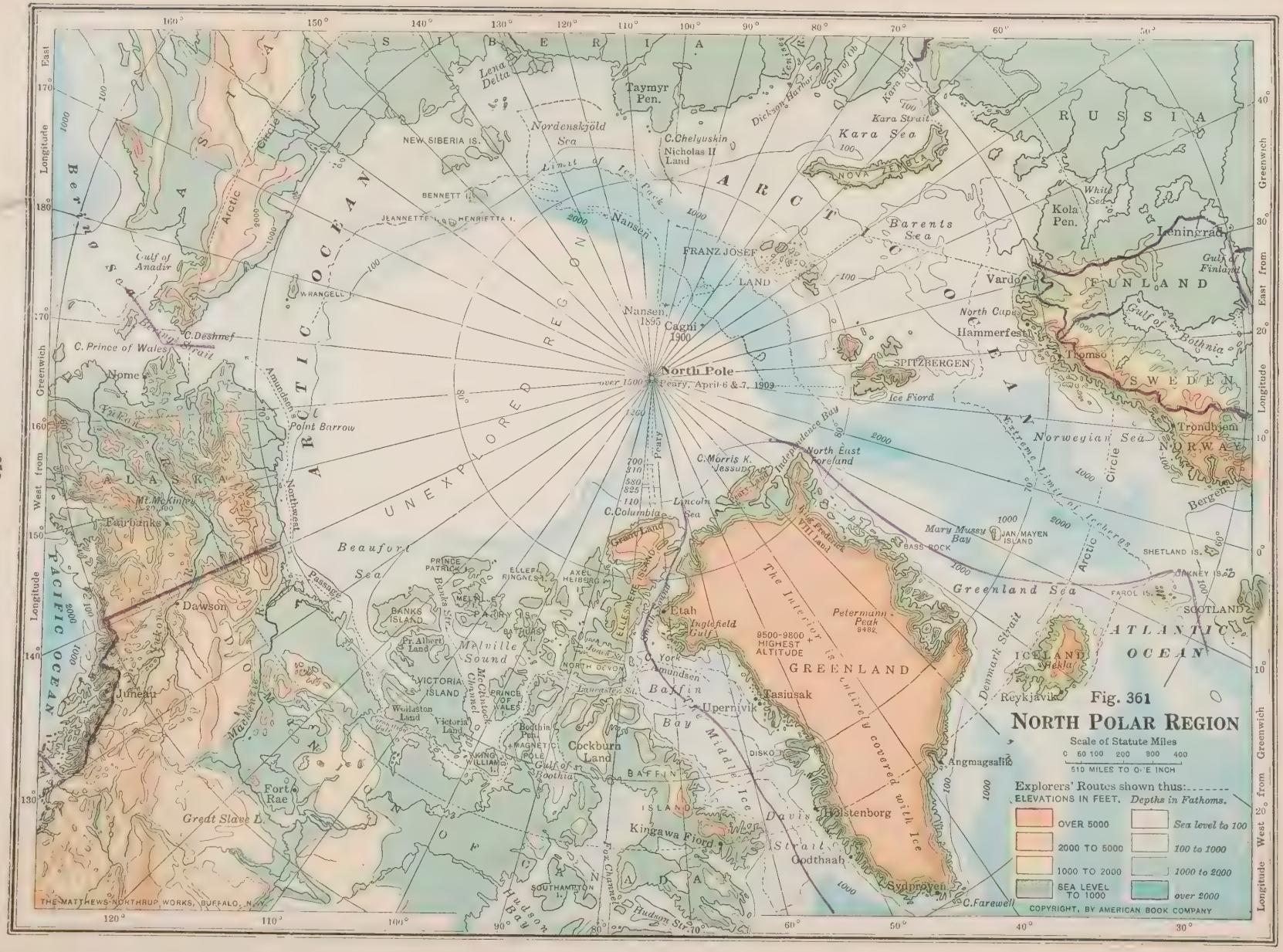
Fig. 361
NORTH POLAR REGION
Scale of Statute Miles
0 50 100 200 300 400
510 MILES TO ONE INCH
Explorers' Routes shown thus:
ELEVATIONS IN FEET.
OVER 5000
2000 TO 5000
1000 TO 2000
SEA LEVEL TO 1000
Depths in Fathoms.
Sea level to 100
100 to 1000
1000 to 2000
over 2000
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THE MATTHEWS-NORTHRUP WORKS, BUFFALO, N.Y.
North Pole
Peary, April 6 & 7, 1909
Nansen, 1895
Cagni, 1900
Over 1500
UNEXPLORED REGION
ARCTIC OCEAN
ASIA
SIBERIA
RUSSIA
ALASKA
GREENLAND
ICELAND
FINLAND
SWEDEN
NORWAY
SCOTLAND
Lena Delta
Taymyr Pen.
Nordenskjöld Sea
NEW SIBERIA IS.
BENNETT I.
JEANNETTE I.
HENRIETTA I.
Nansen
Limit of Ice Pack
C. Chelyuskin
Nicholas II Land
Kara Sea
Kara Strait
NOVAYA ZEMLYA
Barents Sea
White Sea
Kola Pen.
Leningrad
Gulf of Finland
Vardo
North Cape
Hammerfest
Gulf of Bothnia
Tromso
SPITZBERGEN
Ice Fiord
Trondhjem
Norwegian Sea
Bergen
Arctic Circle
FRANZ JOSEF LAND
Gulf of Anadir
W. RANGELL I.
Bering Strait
C. Deshnef
C. Prince of Wales
Nome
Yukon
Fairbanks
Mt. McKinley 20,300
Point Barrow
Northwest Passage
Beaufort Sea
Amundsen
Parry Is.
Prince Patrick
Ellef Ringnes I.
Axel Heiberg I.
Melville I.
Banks Island
Fr. Albert Land
Melville Sound
Dawson
Juneau
Victoria Island
Prince of Wales
Wollaston Land
Victoria Land
Mackenzie R.
Great Slave L.
Fort Rae
Bodthia Pen.
Magnetic Pole
King William I.
Gulf of Boothia
Cockburn Land
Lancaster Sd.
North Devon
Barrow Str.
Smith Sound
Ellesmere Island
C. Columbia
Grant Land
Lincoln Sea
C. Morris K. Jessup
Independence Bay
North East Foreland
Robeson Channel
Peary Land
Kane Basin
Kane Sea
Hall Land
Petermann Peak 9482
9500-9800 HIGHEST ALTITUDE
Inglefield Gulf
Etah
C. York
Amundsen Gulf
Baffin Bay
Upernivik
Tasiusak
Disko
Angmagsalik
Holstenborg
Godthaab
Sydproven
C. Farewell
Davis Strait
Middle Ice
The Interior is entirely covered with Ice
Denmark Strait
Reykjavik
Hekla
ATLANTIC OCEAN
Greenland Sea
Jan Mayen Island
Maru Mussy Bay
Bass Rock
Shetland Is.
Orkney Is.
Faroe Is.
Arctic Circle
Extreme Limit of Icebergs
Frederick VIII Land
Hudson Bay
Hudson Str.
Fox Channel
Southampton I.
King William I.
Baffin Island
Longitude West from Greenwich
Longitude East from Greenwich
Latitude

from point to point along the shores, or made their way from island to island. Gradually they built larger boats and ventured across large bays and out into the open ocean. It was thus that all the lands about the Mediterranean Sea were explored, and the gulfs and headlands of western and northern Europe became known. In modern times Columbus and others crossed the Atlantic, and the expedition of which Magellan was the leader went around the world.

Fig. 362. Taking observations at sea

Until about a hundred years ago ships were moved by sails, and it often took several weeks to cross the Atlantic. Now steamships are in use which travel at the rate of 20 to 25 miles an hour, and go from New York to Liverpool or Rotterdam in from five to seven days. Such are the large and fine ships built for passenger service. The larger of these are 700 to 900 feet in length and can carry several thousand passengers.

Slower ships carry freight and passengers across the Atlantic in about ten days, and the passage from San Francisco, Seattle, or Vancouver, to Japan, China, or the Philippine Islands, takes about three weeks. Besides the steamship *lines*, whose vessels make regular trips joining the great seaports and countries of the world, there are a vast number of merchant ships known as *tramps*, which go wherever they can find a cargo.

By means of the compass, by observations on the sun, and in other ways the captain of a modern vessel can tell just where his ship is (Fig. 362). If the ship is not far from shore, lighthouses may serve as guides. By wireless telegraph mariners not only communicate with each other but may call radio stations on the shore, which observe directions and quickly compute a ship's exact position. This method is specially important during fogs.

THE POLAR REGIONS

358. Arctic Ocean.—The Arctic Ocean covers the region of the North Pole and stretches southward to the shores of North America, Europe, and Asia. It is joined to the Pacific Ocean by Bering Strait, 36 miles wide, and to the Atlantic Ocean by the wide sea in which Iceland lies. East of Iceland the warmer waters drift to the north of Europe and keep that part of the sea freer of ice than the regions north of our own continent. West of Iceland and west of Greenland, the Arctic waters flow southward and form the cold Labrador current.

359. Arctic Travel.—Many daring voyages and sledge journeys across frozen lands and ice floes have been made during the past hundred years in order to learn about these northern regions. Many men and ships have been lost, but others have dared to keep up the search. Explorers have been compelled at times to travel and camp in temperatures ranging from 50° to 70° below zero. They travel on land or ice, carrying their camping outfit and food on sledges drawn by dogs, and they sleep in bags made of skins. They usually have the help of the native Eskimos, from whom they also obtain the dogs.

The floe ice or ice pack crumples into rough ridges, or breaks into fields with lanes or "leads" of open water between, so that sledging over it is very dangerous.

The map (Fig. 361) shows that much of the Arctic region is still unexplored.

360. Recent Arctic Explorers.—In 1895 Nansen, a Norwegian explorer, took his ship, the *Fram*, far into the ice pack north of Asia, and then went by sledge to latitude 86° 14′. In 1900 part of the expedition under the Duke of Abruzzi, an Italian explorer, went to 86° 33′. On April 6, 1909, Peary, an

Fig. 363

SOUTH POLAR REGION

Scale of Statue Miles

0 500 1000

1030 MILES TO ONE INCH

Explorers' Routes to South Pole shown thus:

Elevations in feet.

- OVER 5000
- 2000 TO 5000
- 1000 TO 2000
- SEA LEVEL TO 1000

Depths in fathoms.

- Sea level to 100
- 100 to 1000
- 1000 to 2000
- over 2000

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PACIFIC OCEAN

ATLANTIC OCEAN

INDIAN OCEAN

ANTARCTIC OCEAN

SOUTH AMERICA

AUSTRALIA

AFRICA

ANTARCTIC CONTINENT

UNEXPLORED

Limit of Floating Icebergs

Antarctic Circle

Tropic of Capricorn

Cape Horn

Strait of Magellan

Punta Arenas

FALKLAND IS.

SOUTH SHETLANDS

GRAHAM LAND

ELEPHANT I. 3494

ROSS I. 5542

SOUTH ORKNEYS 5397

SOUTH GEORGIA

SANDWICH GROUP

TRISTAN DA CUNHA 7641

BOUVET I. 3066

PETER 1ST I.

ADELAIDE I.

Alexander Land

Charcot Land

Supposed Limit of Ice Pack

Supposed Limit of Land

Weddell Sea

King Edward VII Land

Amundsen's Base

Prinzregt. Luitpold Land

Coats Land

Queen Maud Range

South Pole

Amundsen, Dec. 16, 1911

Scott, Jan. 17, 1912

King Haakon VII Plateau

Ross Sea

Great Ice Barrier

Mt. Erebus 12,400

Scott's Base

C. Adare

Beardmore Glacier

SOUTH VICTORIA LAND

MAGNETIC POLE

BALLENY IS.

CHATHAM IS.

BOUNTY I.

ANTIPODES I.

Auckland

Wellington

Port Lyttelton

Cook Strait

NEW ZEALAND

CAMPBELL I. 1866

AUCKLAND I. 2001

MACQUARIE IS. 1000

LORD HOWE I.

Sydney

Hobart

TASMANIA

Melbourne

Adelaide

Adelie Land

Clarie Land

Sabrina Land

Knox Land

WILKES LAND

Kaiser Wilhelm II Land

Enderby Land

Kemp Land

Cape of Good Hope

Cape Town

Durban

PRINCE EDWARD I. 4200

MARION I.

CROZET IS. 4922

HEARD I.

MC DONALD I.

KERGUELEN I. 6119

Extreme Limit of Floating Icebergs

THE MATTHEWS-NORTHRUP WORKS, BUFFALO, N. Y.

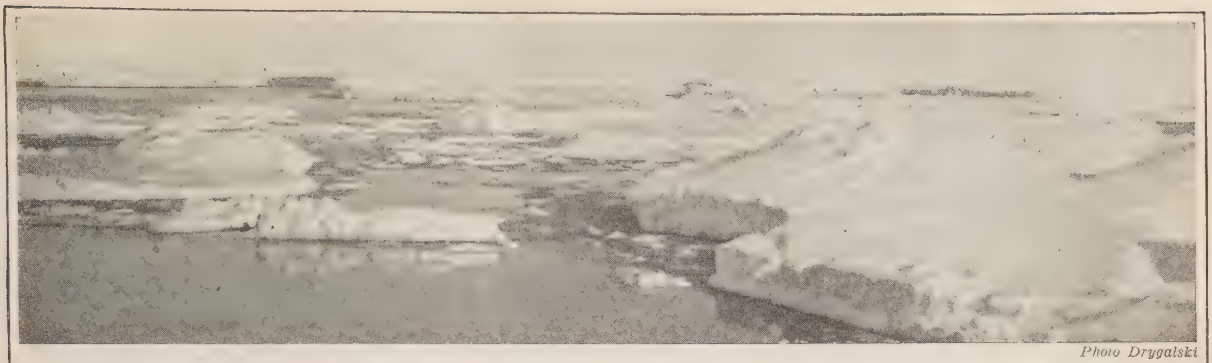

Photo Drygalski

Fig. 364. Antarctic sea border, showing vast tabular icebergs and the edge of the ice-covered continent

officer of the United States navy, reached the North Pole and raised the American flag there. He had explored northern Greenland and the polar ice for many years, and at last gained the goal for which so many explorers had long striven.

361. Antarctic Regions.—The Antarctic region is very different from the far north. There are no land masses to separate the Antarctic Ocean from the Atlantic, Pacific, and Indian oceans, but the name is given to the waters that stretch around the world near the Antarctic Circle. In these waters there are many icebergs from the great glaciers on Antarctic lands, for the south polar region is a continent instead of a sea. It is not known how far it is a true continent, nor to what extent the lands consist of large islands, but it is thought that the continent may be as large as Europe or larger. Explorers have sailed hundreds of miles along the edge of a single ice sheet where it pushes into the sea. In some places there are high mountains and active volcanoes. Mt. Erebus is an active volcano, and is more than 13,000 feet in altitude.

362. Recent Antarctic Explorations.—In 1909 a British exploring party under Sir Ernest Shackleton reached a point 111 miles from the South Pole. The Pole itself was finally reached by a Norwegian explorer named Roald Amundsen, on December 16, 1911. A few weeks later it was also reached by another party under the leadership of Captain Scott of the British navy. On the return trip Scott and several of his men died of starvation. Records of their last days have been recovered, and the story which they tell is one of fearful hardship and wonderful bravery.

The elevation at the South Pole is about 10,000 feet above sea level. At the North Pole there is an ice-covered sea, and at the South Pole an ice-covered land.

Review.—1. How does the ocean bottom differ from the surface of the lands? 2. What is a continental shelf? 3. What is the origin of many of the high islands of the ocean? 4. What is a coral reef? 5. Why is ocean water salty? 6. How do the surface and bottom waters near the Equator differ in temperature?

7. Why are breakers often seen near the shore when the waters farther out are smooth? 8. What are the results of wave action on high coast lands? 9. What is a barrier beach?

10. Describe the currents in the north Atlantic Ocean; in the south Atlantic Ocean. 11. How is the direction of ocean currents determined? 12. Where is the Peruvian current?

13. What is the ebbing of the tide? 14. Name localities where the tides are high. 15. What causes tides?

16. Give some of the uses of the ocean. 17. What length of time do modern ships require for crossing the Atlantic Ocean?

18. Give the name of the explorer who reached the North Pole, and the year in which he discovered it. 19. Name the discoverer of the South Pole. 20. How does the north polar region differ from the south polar region?

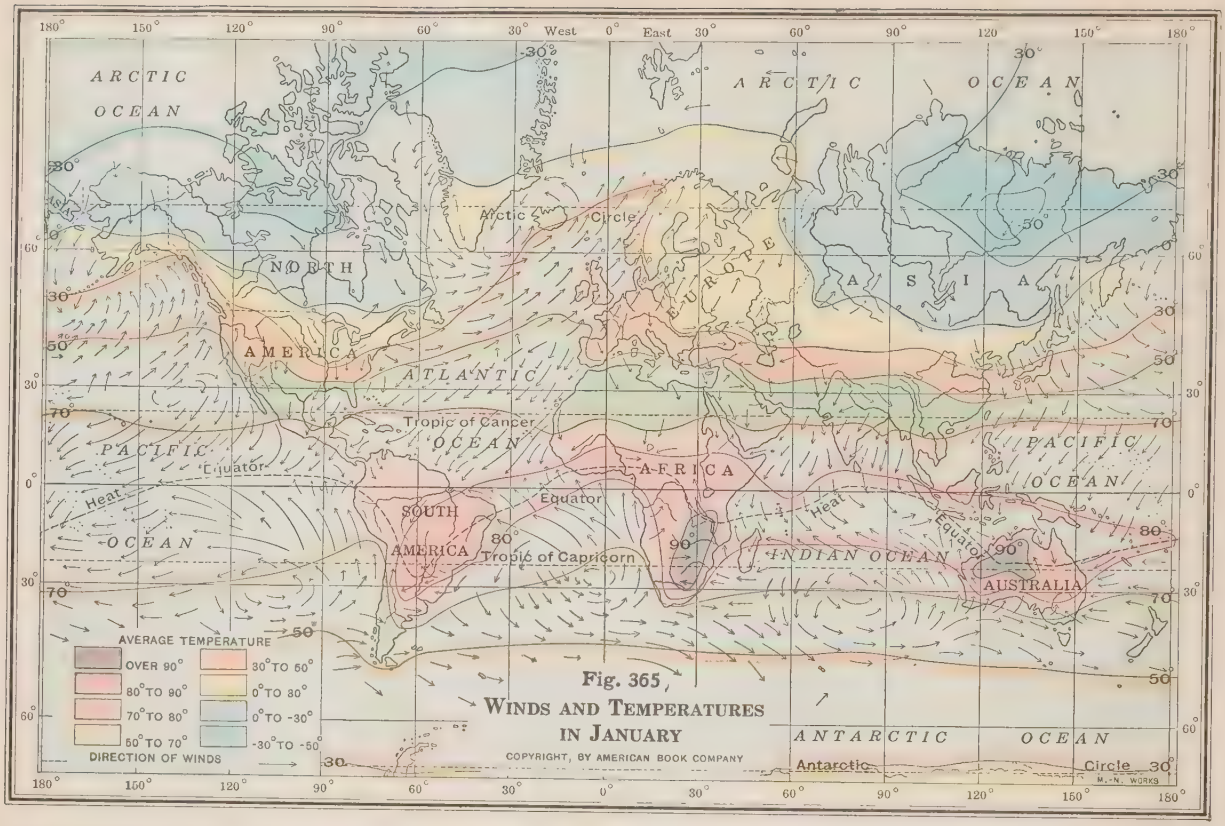

Fig. 365,
WINDS AND TEMPERATURES IN JANUARY

Fig. 366
WINDS AND TEMPERATURES IN JULY

WORLD WINDS

363. Westerly Winds of the North Temperate Region.—In studying sections 363–367 consult Figures 33, 365, 366, and 367. We have already learned some facts about the westerly winds in our study of North America and the United States. From the North Pacific Ocean they reach southern Alaska, Canada, and the United States. With them comes moisture which falls as rain and snow along the coast and on the windward side of the western mountains. But after crossing the mountains the winds descend to the lower lands farther east as drying winds, with the result that the plains and plateaus just east of the high mountain ranges are arid.

Along with these winds, on their way east, whirling storms, or cyclones, are produced, and we have a succession of warm weather with rain or snow, followed by cool and clear weather. The winds move on across the north Atlantic and bring to western Europe warm air and much rain, as in the case of the Pacific Ocean and western North America.

The westerly winds pass on across Germany and Russia, but they carry less heat and moisture to these countries, and still less to Asia. Eastern Europe and western and central Asia, therefore, have a continental climate, like that of the upper Mississippi basin, marked by extremes of heat and cold.

The prevailing westerly winds of the north temperate region do not blow exactly from the west, but usually from a direction south of west. An American making a voyage to Europe is much less likely to meet "head winds" than when returning. The pupils should make and study a record showing the direction of the wind twice a day for several weeks.

364. Westerly Winds of the South Temperate Region.—As the westerlies of the Northern Hemisphere do not blow directly from the west but usually from directions south of west, so those of the Southern Hemisphere commonly blow from directions north of west. These winds of the south temperate region are much more steady than those in the northern latitudes, because they are much less disturbed by the influence of lands and high mountains. South America is the only continent that reaches far enough south to be across their path, and the southern part of this continent is narrow. The greater part of the zone of the westerlies is south of Africa and Australia, and hence they blow freely around the world. They are also much less interrupted by whirling storms or cyclones than the westerlies of the north temperate belt.

The strength and steadiness of these westerly winds is of importance to the masters of sailing vessels, who call the region the "roaring forties" and the winds the "brave west winds." They dread to beat their way around Cape Horn to the west, because the winds are against them, the air is raw, and the sea is rough. A sailing vessel from the north Atlantic countries, bound for Australia or the south Pacific islands, will go eastward past the Cape of Good Hope and follow the westerlies to its destination. Then it will continue east with the favorable wind, pass Cape Horn, and return through the Atlantic Ocean to the place from which it started.

The effect of the prevailing westerly winds in giving rain to southern Chile and in making southern Argentina dry is described in section 314.

365. Northeast Trade Winds.—The northeast trade winds blow from the northeast across the West Indies, Mexico, Central America, and the northern part of South America (Sec. 314). Blowing from the ocean, they bring a heavy rainfall to the eastern highlands and slopes of these regions.

They continue across the Pacific Ocean and bring ample rains to the northeastern

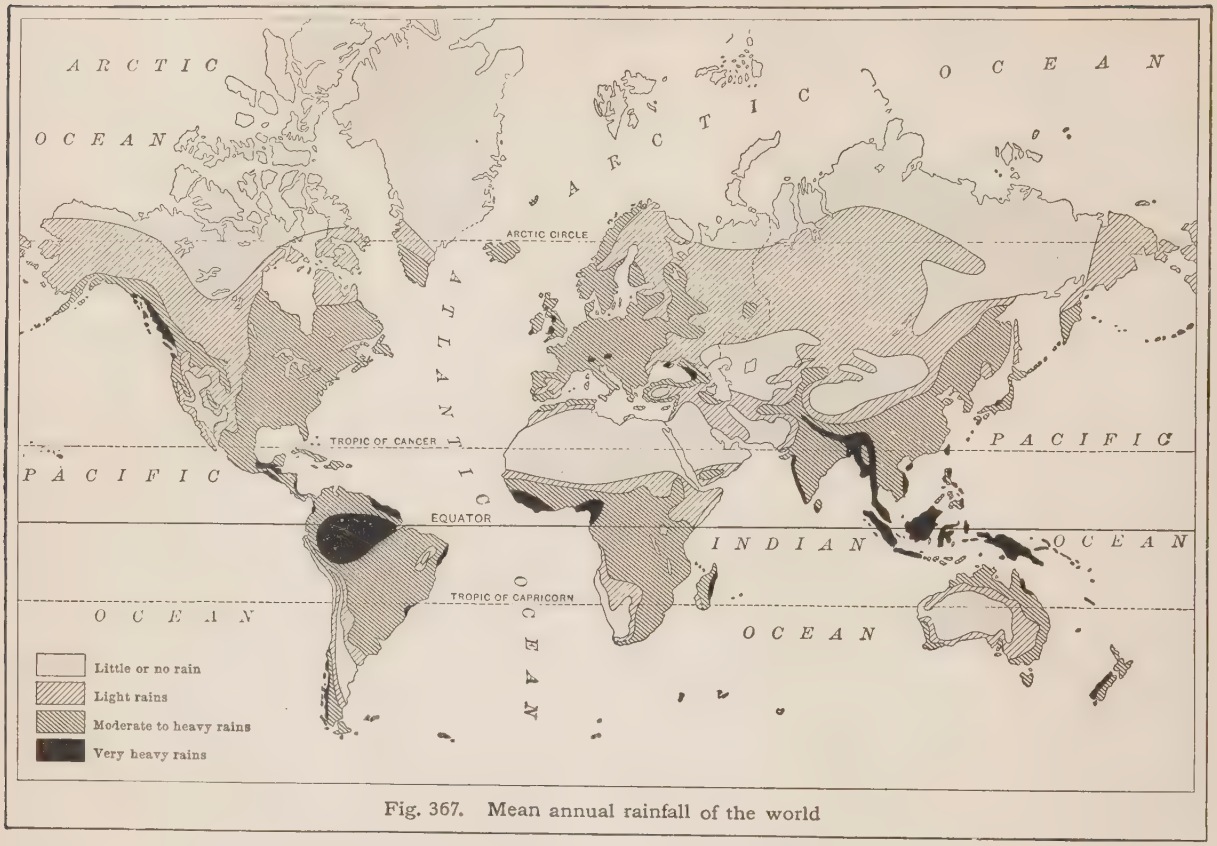

Fig. 367. Mean annual rainfall of the world

slopes of the Hawaiian Islands. Likewise they bring rains to the Philippine Islands and to parts of southeastern Asia. India is in the trade-wind belt, but has special winds called *monsoons* which will be explained in section 373.

The northeast trades also cross southwestern Asia and north Africa. Here they blow for such long distances over the land that they do not receive much moisture. Since they blow from northeast to southwest, they are always passing from a cooler into a warmer region. As air grows warmer, more moisture can be evaporated into it; hence winds that are warmed are ready to receive moisture instead of giving it up as rain. The northeast trades passing over Arabia, Egypt, and the Sahara region are warmed, and are drying winds, and therefore these lands are deserts.

Sailors take advantage of the trades as they do of the westerlies. It was easy for Columbus, in spite of his fear of unknown seas, to sail from a Spanish port to the West Indies because he was in the course of the northeast trade winds. It was also easy for other Spanish or Portuguese navigators to sail to the northern and eastern shores of South America.

366. Southeast Trade Winds.—South of the Equator the trade winds of the Southern Hemisphere blow from the southeast (Fig. 33). Crossing the south Atlantic, they blow across the widest part of South America. As the moist air is pushed to greater altitudes in crossing the higher lands, these winds bring a heavy rainfall to the eastern slopes of the Brazilian Highlands, and to the east slopes of the Andes. West of the Andes, however, in the "rain shadow" of the mountains, are the desert parts of Chile and Peru (Secs. 314, 328, 329).

Crossing the Pacific Ocean, the southeast trades reach eastern Australia. The principal mountains of this continent are in the east (Fig. 566), and as the air rises in crossing them it is cooled, and there is abundant rain on the eastern slopes. West of the mountains the rainfall is much less, so that the central and western parts of Australia are mainly desert.

In like manner these winds affect a large part of southern Africa. The well-watered regions are in the east, while the dry regions are on the western or Atlantic side of the continent.

367. The Belt of Equatorial Calms.—Between the two trade-wind belts is a region of *equatorial calms*, or *doldrums*, in which there are no prevailing winds. This belt is dreaded by the masters and crews of sailing vessels because they often have to wait many days before there is wind enough to take them across it. It is also a region of frequent and heavy rains. The mornings are usually clear, but as the hot part of the day comes on the air is heated, expands, and in the upper atmosphere spreads out toward the polar regions. At the surface the cooler, heavier air of the trade winds pushes in from both sides and crowds under the heated air. As the heated and lighter air, containing much water vapor, is pushed upward, it is cooled, and the moisture condenses and falls as rain. This is similar to what happens in a thunderstorm in midsummer in the temperate latitudes.

A ship going from St. Johns, in Newfoundland, to Punta Arenas, in southern South America, would cross first the belt of the westerly winds of the Northern Hemisphere; second, the region of northeast trades; third, the belt of equatorial calms; fourth, the region of the southeast trades; and fifth, the belt of westerlies of the Southern Hemisphere (Fig. 33).

368. Shifting of the Wind and Calm Belts.—In our summer in the Northern Hemisphere the sun at midday is high, and as far north as the Tropic of Cancer is directly overhead at some time during the summer. In our winter the sun at midday is low; the vertical rays are south of the Equator, and near midwinter reach as far south as the Tropic of Capricorn. Thus the direct rays of the sun shift back and forth across the Equator, and the belt of greatest heat, which is the belt of equatorial calms or doldrums, moves northward and southward. The great wind belts to the north and south of it shift in the same way, through several degrees of latitude, with each year's change of seasons (Figs. 365, 366).

369. Wet and Dry Seasons.—Since rain is plentiful in the doldrum belt, we can understand why many warm countries have a dry and a wet season each year. When the belt of calms, in shifting its position to the north or south, is over one of these warm countries, that country has rains. When the belt of calms has passed to the north or south, the country is crossed by the trade winds and becomes comparatively dry. Near the Equator are some regions that are completely crossed by the shifting wet belt twice a year, and twice entirely left behind by it. Such regions have two wet and two dry periods each year.

370. World Winds and the Ocean Currents.—The waters of the equatorial currents (Secs. 348–350) move westward and thus have a direction much like that of the trade winds. The waters in the temperate belt of the north Atlantic move eastward, as do the prevailing westerly winds. In like manner the waters of the south Atlantic eddy move eastward in the track of the westerlies of the Southern Hemisphere. In the Pacific Ocean the east and west winds and currents correspond in the same way.

If there were no continents to block the way, these currents of water would flow around the earth. But they strike the lands and are turned from their course. For ex-

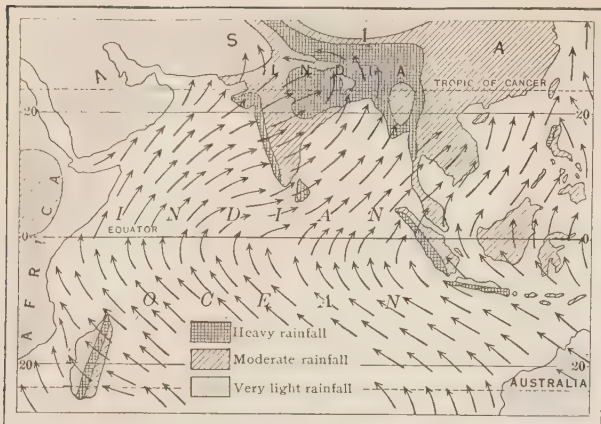

Fig. 368. Winds and rainfall of southern Asia in July

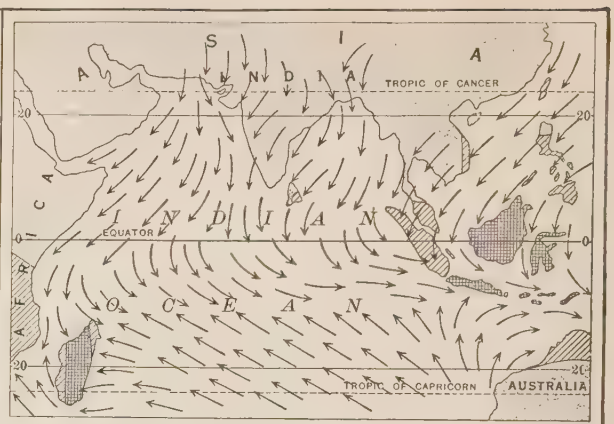

Fig. 369. Winds and rainfall of southern Asia in January

ample, the equatorial current of the Atlantic divides, in the western part of the ocean, and some water goes north and some south until it is caught in the east-moving current. The east-moving currents in their turn strike the coasts of Europe and Africa, and thus complete the two great eddies of the Atlantic Ocean. In this way the world winds and the continents combine to direct these slow but great movements of the ocean waters.

CAUSES OF WINDS

371. Movements in Small Bodies of Air.—When a door is opened between a warm room and a cold room, the heavier air of the cold room pushes in beneath the lighter air of the warm room, and there is what we call a draft. This is really a small wind. When a bonfire is built, the air above it, with the particles of smoke and the gases of the flame, is heated, expands, and is pushed upward. The air rises not because it has no weight, but because the cooler air is heavier and pushes in below the heated air. This movement is a light wind. The same thing occurs when a fire is built in a stove, or when a lamp is lighted in a room.

372. Shore Winds.—On the shores of a lake or ocean, breezes are formed in a similar way. In the daytime, under a hot sun, the land absorbs heat rapidly and becomes warmer than the water, and the air over the land is heated and becomes lighter. This light, warm air is lifted up by cooler and heavier air that moves in from the water as a lake or sea breeze. At night the land cools more than the water, and the heavier air from the land spreads out under the warmer and lighter air that is over the water; this movement is a land breeze.

373. Monsoons.—In the summer the land of India and other parts of southern Asia is very much heated. The air expands and flows outward in the upper atmosphere so that the air that remains presses less heavily on the surface, and the cooler, heavier air from the Indian Ocean pushes in and creates strong winds blowing from the ocean over the land. A great amount of moisture moves inland with them and falls as rain, making a part of India the wettest region in the world. Along the lower Ganges, several hundred inches of water fall each year, and in the region of heaviest rainfall it amounts to 50 or 60 feet a year.

In the winter the land is cooler than the ocean, and the winds are then reversed, blowing southward and giving the country its dry season.

These seasonal winds, blowing from one direction in summer and from the opposite direction in winter, are called *monsoon winds*, or simply *monsoons*.

374. World Winds.—Since the earth's surface is warmer in the equatorial regions than it is in the temperate and polar regions, the air is expanded and its upper parts flow off to the north and south towards the poles. At the same time the cooler air at the surface of the earth on the north and south of the equatorial calm belt moves in and forces the warm air to higher levels. This is the cause of the trade winds.

These winds, however, do not blow directly toward the Equator from north and south, as we should expect, but they blow obliquely toward the Equator from the northeast and southeast. This turning of the trade winds to the westward is due to the rotation of the earth on its axis.

If the air should continue to move toward the Equator without any return currents, all the air would soon be piled up in one belt around the globe. But the air that moves upward in the belt of calms turns to the north and south and flows back over the trade winds. These upper currents are the *anti-trade winds* (Fig. 370). They are known to be real winds because they are felt on some high mountains that reach above the level of the trade winds. Sometimes also high clouds drifting along with these winds may be seen moving in a direction opposite to that of the trades.

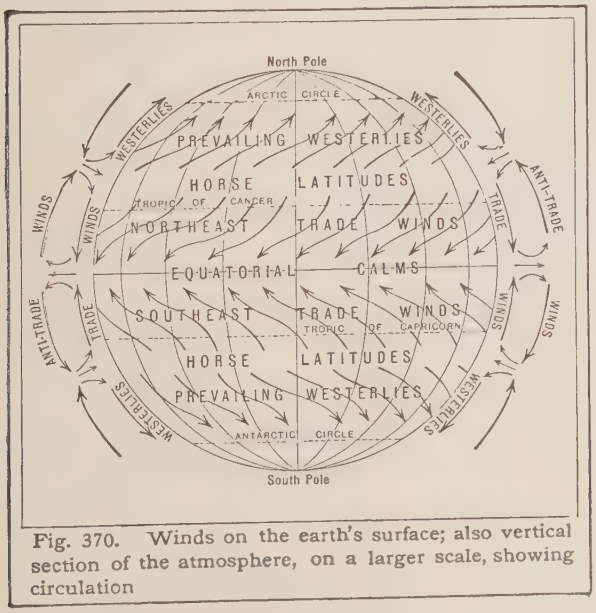

Fig. 370. Winds on the earth's surface; also vertical section of the atmosphere, on a larger scale, showing circulation

When the air of the anti-trades reaches the north and south limits of the trades, it descends to the earth in calm belts, known as the *horse latitudes* (Figs. 33 and 370). These lie between 30° and 35° north latitude and between 30° and 35° south latitude. Some of the descending air supplies the trade winds and goes back toward the Equator; some of it moves to the northeast in the Northern Hemisphere and to the southeast in the Southern Hemisphere, and forms, in both Temperate Zones, the prevailing westerly winds. While the trade winds turn toward the west, the winds of the Temperate Zones turn aside toward the east on account of the rotation of the earth.

Thus the great winds keep up a circulation of the atmosphere between low and high latitudes and between the lands and the oceans. In this way both heat and moisture are widely distributed over the surface of the earth, and countries are made useful to man that otherwise could provide little to meet his needs.

Review.—1. What regions of much rain are in the track of the westerly winds of the Northern Hemisphere? 2. Indicate the track of the westerly winds and their cyclonic storms in this hemisphere (Sec. 363 and Fig. 33). 3. What name is given by sailors to the westerlies of the Southern Hemisphere? 4. Why are these winds more steady than those of the Northern Hemisphere? 5. How do these winds affect the course of sailing vessels?

6. What great desert is in the track of the northeast trade winds? 7. What other dry regions occur in this belt? 8. Name the wet and dry regions in the track of the southeast trades.

9. Where is the belt of calms? Why is its rainfall large? 10. Why does the belt of calms shift in its position? 11. What is the effect upon the seasons in certain regions?

12. What are the causes of the great eddies in the oceans?

13. Give examples to explain the origin of winds. 14. Give an account of the anti-trade winds. 15. What are some of the advantages that come to man by means of the world winds?

Fig. 371

Political

EUROPE

Scale of Statute Miles

0 100 200 300 400 500

430 MILES TO ONE INCH

Capitals thus: ⊙

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Facing 260

EUROPE IN 1914, BEFORE THE WORLD WAR. For comparison with Fig. 371

ARCTIC OCEAN
ATLANTIC OCEAN
North Cape
Hammerfest
Vardo
Murmansk
Kola Peninsula
Kanin Peninsula
Sea of White
Archangel
Dvina R.
Pechora R.
Ural Mountains
NATURAL BOUNDARY OF EUROPE
Ob R.
SIBERIA
Kara Strait
NOVA ZEMBLA
VAIGACH I.
KOLGUEF I.
Arctic Circle
Reykjavik
ICELAND
(To Den.)
Mt. Hekla
FAROE IS.
(To Den.)
SHETLAND IS.
ORKNEY IS.
HEBRIDES IS.
LOFOTEN IS.
Lapland
FINLAND
Tornea
Uleaborg
Gulf of Bothnia
Tammerfors
Lake Onega
Lake Ladoga
Abo
Helsingfors
Gulf of Finland
St. Petersburg
Revel
L. Peipus
Valdai Hills
Rybinsk
Yaroslav
Nizhni Novgorod
Kazan
Ufa
Perm
Ekaterinburg
Volga R.
Tver
Moscow
Samara
Orenburg
Uralsk
Saratof
Tula
Orel
Kursk
Kharkof
Kief
Ekaterinoslaf
Rostof
Astrakhan
Tsaritsyn
Dnieper R.
Don R.
Ural R.
Caspian Sea
Caucasus Mts.
Mt. Elburz
Mt. Ararat
Tiflis
Baku
Batum
Black Sea
Sea of Azof
Kherson
Odessa
CRIMEA
Sebastopol
Ekaterinodar
Kishenef
Jassy
Transylvanian Alps
RUMANIA
Bucharest
Danube R.
Constantinople
Adrianople
Balkan Mts.
BULGARIA
Sofia
Monastir
Salonica
Gulf of Salonica
GREECE
Smyrna
Athens
TURKEY IN ASIA
ARMENIA
Euphrates R.
Tigris R.
Persian Gulf
CYPRUS
CRETE
Aegean Sea
Sea of Marmora
Dardanelles
Kiel Canal
Christiania
Bergen
Stavanger
Trondhjem
Gefle
Stockholm
Norrkoping
Gothenburg
Skagerrack
Kattegat
Gulf of Bothnia
Baltic Sea
Gulf of Riga
Riga
Vitebsk
Minsk
Vilna
Konigsberg
Danzig
Warsaw
Lodz
Duna R.
Vistula R.
Dniester R.
Carpathian Mts.
Lemberg
Prague
Krakow
BOHEMIA
AUSTRIA
Vienna
Budapest
HUNGARY
Szegedin
Theiss R.
Danube R.
Hamburg
Bremen
Stettin
Berlin
Magdeburg
Leipzig
Dresden
Breslau
Frankfort on the Main
Nuremberg
Elbe R.
Oder R.
Weser R.
Rhine R.
Main R.
Amsterdam
Rotterdam
Antwerp
Brussels
Cologne
Dusseldorf
Essen
Aix-la-Chapelle
Liege
Namur
Ostend
Calais
Dover
Boulogne
Amiens
Rouen
Havre
Cherbourg
Brest
Nantes
Paris
Orleans
Tours
Strassburg
Basel
Stuttgart
Munich
Zurich
Berne
Geneva
Lyon
St. Etienne
Limoges
Bordeaux
Toulouse
Marseille
Nice
Mt. Blanc
Milan
Turin
Genoa
Venice
Trieste
Fiume
Bologna
Florence
Leghorn
Rome
Naples
Mt. Vesuvius
Brindisi
Durazzo
Cetinje
MONTENEGRO
SERBIA
Belgrade
Dinaric Alps
Adriatic Sea
Albanian Mts.
Ionian Sea
CORFU
IONIAN IS.
Palermo
SICILY
Mt. Etna
Messina
Catania
MALTA
Tyrrhenian Sea
Strait of Messina
SARDINIA
CORSICA
Algiers
Tunis
Fez
AFRICA
Mediterranean Sea
Gibraltar
Tangier
Malaga
Cadiz
Seville
Sierra Nevada
Cartagena
Murcia
Valencia
Barcelona
Madrid
Saragossa
Lisbon
Oporto
PORTUGAL
SPAIN
Pyrenees Mts.
Cantabrian Mts.
Bilbao
ANDORRA
BALEARIC IS.
C. Finisterre
C. St. Vincent
Strait of Gibraltar
Bay of Biscay
English Channel
St. George's Channel
Irish Sea
North Sea
Skagerrack
Kattegat
Gulf of Bothnia
Baltic Sea
Gulf of Riga
Gulf of Finland
Dover Strait
Strait of Calais
Strait of Gibraltar
Strait of Messina
Dardanelles
Sea of Marmora
Aegean Sea
Ionian Sea
Tyrrhenian Sea
Mediterranean Sea
Black Sea
Caspian Sea
Persian Gulf
Red Sea
Arabian Sea
Indian Ocean
Aral Sea
Lake Aral
Lake Balkash
Lake Baikal
Lake Issyk-Kul
Lake Tchad
Lake Victoria Nyanza
Lake Tanganyika
Lake Nyasa
Lake Rudolf
Lake Albert Nyanza
Lake Tsana
Lake Ngami
Lake Chilwa
Lake Bangweolo
Lake Mweru
Lake Shirwa
Lake Kivu
Lake Leopold II
Lake Dilolo
Lake Nyassa

TERRITORIAL CHANGES IN EUROPE, RESULTING FROM THE WORLD WAR

NEW COUNTRIES

Poland, about 150,000 square miles, population about 27,500,000.

Danzig, about 600 square miles, population 365,000.

Lithuania, about 25,000 square miles, population about 2,300,000.

Latvia, 24,000 square miles, population about 1,500,000.

Esthonia, about 18,500 square miles, population 1,110,000.

Sarre Basin, about 750 square miles, population about 650,000.

Czechoslovakia, 54,700 square miles, population about 13,500,000.

Fiume, 10 square miles, population about 50,000. In 1924 Fiume was transferred to Italy.

Finland, 130,000 square miles, population about 3,400,000.

GAINS OF EXISTING COUNTRIES

France gained Alsace-Lorraine, about 5600 square miles with population about 1,800,000.

Belgium gained about 385 square miles with population about 150,000.

Denmark gained about 1530 square miles with population about 230,000.

Italy gained about 12,500 square miles with population about 1,900,000.

Serbia expanded into *Yugoslavia* by union with Montenegro and the southern provinces of Austria-Hungary, and slight gains from Bulgaria and perhaps Albania. Before the war Serbia and Montenegro together had an area of about 39,500 square miles and a population of about 5,000,000. Yugoslavia or Greater Serbia has about 95,000 square miles and about 12,000,000 population.

Rumania gained more than 60,000 square miles with population over 8,000,000. Both area and population were more than doubled.

Greece gained about 13,000 square miles with population about 1,400,000, in Europe, besides territory in Asia Minor; but as a result of war with Turkey in 1922 lost nearly all her gains except small areas south of Bulgaria.

LOSSES OF EXISTING COUNTRIES

Germany lost about 30,000 square miles with population about 6,000,000. It still has a much larger population than any other European country except Russia.

Austria lost about 84,000 square miles with population about 22,000,000. Austria now has about 30,700 square miles, population about 6,000,000.

Hungary lost about 89,000 square miles with population over 12,000,000. Hungary now has about 36,000 square miles, population about 7,800,000.

Bulgaria lost about 3000 square miles with population about 300,000.

Turkey lost most of the territory remaining to her in Europe, but in 1922 regained nearly all of it, so that her territory in Europe is now almost what it was in 1914.

Russia suffered severe losses. Before the war her area in Europe was about 2,000,000 square miles, population about 140,000,000. The losses aggregate about 300,000 square miles and (from cessions, war, and famine) 45,000,000 population, leaving about 1,700,000 square miles and 95,000,000 population for the present Russia in Europe.

Fig. 372. North Cape, as seen from the east

EUROPE

Map Study.—1. What is the latitude of North Cape? Of Gibraltar, at the southwest of Europe? 2. Find three important European cities that are near the parallel of 40° north latitude. 3. What states of our own country are crossed by this parallel?

4. What countries of Europe border the Black Sea? The Mediterranean Sea? 5. Locate the Baltic Sea; the North Sea; the Bay of Biscay; the White Sea. 6. Name the great peninsulas of Europe (Fig. 373). 7. Make a sketch map of the coast line of Europe, naming the principal seas and bays, and the important islands.

8. Describe the course of the Rhine, the Danube, the Rhone, and the Po. 9. Describe the course of three of the chief rivers of Russia.

10. What countries border upon Germany? 11. What countries have no seacoast?

12. On what waters would a ship travel in going from Odessa to Leningrad (Petrograd)?

PHYSICAL FEATURES

375. Position.—Europe has many bays, seas, peninsulas, and islands along its coast. In proportion to its size it has a much longer coast line than any other continent. On the east, it has for the most part a land boundary, and we may think of Europe as a great peninsula of the larger continent, for Asia is more than four times as large as Europe. Asia and Europe are sometimes considered to be parts of one continent, called Eurasia; but they have had such different histories that they are generally called two continents.

Europe joins Asia and is near Africa, and the journey between Europe and North America can now be made in about five days. No other continent is so near to all these other continents as Europe. Its central position among the continents has given its people great advantages in trading with other nations.

A very large part of its total area is in the temperate belt. The most northern point is North Cape (Fig. 372), a little more than 71° north of the Equator. Small parts of four countries, Norway, Sweden, Finland, and Russia, are north of the Arctic Circle. The most southern point is in Spain at about 36° north latitude. This corresponds in latitude with North Carolina, Tennessee, and northern Arizona. Although Europe has no land in the Torrid Zone, it is warmer, as a whole, than North America or Asia.

Fig. 373
Physical
EUROPE
Scale of Statute Miles
0 100 200 300 400 500
430 MILES TO ONE INCH

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376. Mountains.—Europe has two mountain regions, with a lowland between them. This is also the general arrangement of highland and lowland in North America and in South America (Sec. 311). A chain of mountains runs the whole length of the Scandinavian Peninsula, where the highest peak is 8400 feet above the sea. There are also mountains in Scotland, in the north and west of England, in Wales, in Ireland, and in western France. All these uplands are old and much worn, and together make up the mountain lands of northwestern Europe.

The greatest mountains of Europe, however, are in the south. The chief ranges are the following: the Pyrenees, on the borders of France and Spain; the Alps, in France, Switzerland, Italy, Germany, and Austria (Fig. 374); and the Carpathians, in Czechoslovakia, Poland, and Rumania. South of these are other ranges, such as the Sierra Nevada in Spain, the Apennines in Italy, and many rugged uplands in the Balkan Peninsula.

Fig. 374. A glacier in the Alps

Most of the mountains of southern Europe are much younger and higher than those of northwestern Europe. Since they were uplifted there has not been enough time for weathering, streams, glaciers, and the falling and sliding of rocks and earth to wear them down, as the mountains of Great Britain or Scandinavia have been worn.

The low ranges of the Ural Mountains form a part of the boundary between Europe and Asia.

377. Central Plain.—The central plain of Europe is narrow in the west and broad in the east. It includes parts of southern England, the northern part of France and Belgium, the Netherlands, Denmark, northern Germany, and nearly all of Russia. Around the British Islands the water is shallow, and the bottom is a part of the continental shelf (Sec. 337). If the continent and the shelf were to rise a few hundred feet, all this shelf, including the bottom of the North Sea and of the Baltic Sea, would become a part of the central plain.

South of the Ural Mountains and north of the Caspian Sea the plain of Europe joins with the Asiatic plain that extends through Siberia. There is therefore a continuous lowland reaching from the Atlantic Ocean across Europe and Asia to Bering Strait. In eastern Europe it stretches from the Black Sea to the Arctic Ocean, and all of northern Asia belongs to it.

378. Drainage Slopes.—Europe has four drainage slopes (Fig. 377): (1) The Mediterranean slope includes all the lands that incline toward the Mediterranean and Black seas. (2) The Atlantic slope includes all lands whose rivers flow into the Atlantic Ocean, or into the adjoining North and Baltic seas. (3) The Arctic slope drains into the ocean of that name. (4) In the southeast is a part of the inland drainage basin of the Caspian Sea. This slope and most of the Arctic slope are in Russia.

379. Glacial Invasion.—Like North America, Europe had a glacial period. The ice sheet covered all of Scandinavia and most of Great Britain. As the land then stood at a higher level than now, the ice covered the region of the North and Baltic seas, and swept over much of Germany and Russia (Fig. 375). Most of the Alpine country in Switzerland, France, Italy, Austria, and Germany was also covered with glaciers formed by heavy snows falling in the mountains. The soils were moved, the rocks worn, bowlders scattered, and lakes formed, just as in those parts of North America over which the ice passed.

380. Existing Glaciers.—Small glaciers are still found in the Alps, in the Pyrenees, and in the Scandinavian Peninsula. Nearly all of them are in mountain valleys or on high mountain slopes, as in western America. Some, especially in Switzerland, have long been studied by men of science, and are visited by thousands of tourists every year.

381. Mediterranean Coast Line.—The entire coast line of Europe is very irregular. Seas penetrate far into the land, with the result that the climate of western and southern Europe is oceanic rather than continental in character (Sec. 363). The seas also furnish highways for ocean ships, reaching the largest cities and the regions of densest population. The greatest of these seas is the Mediterranean, which borders Europe on the south, Africa on the north, and extends eastward to Palestine and Asia Minor. For much of the year it is swept by winds that blow across the lands of southern Asia and Europe into northern Africa. These are drying winds, and therefore there is much evaporation from the surface of the Mediterranean. As a result the Mediterranean waters are even more salt than those of the ocean.

Three arms of the Mediterranean extend northward. These are: (1) The Aegean Sea, between Asia Minor and the Balkan Peninsula; into the Aegean the Black Sea discharges through the Bosporus, the Sea of Marmora, and the Dardanelles. (2) The Adriatic Sea, between the Balkan and Italian peninsulas; on its northern shores are the ports of Venice, Trieste, and Fiume. (3) The wide body of water between Italy and Spain; at its northern end is the Gulf of Genoa, and farther west is the great seaport Marseille, near the mouth of the Rhone River.

Southern Europe has three great peninsulas: the Balkan, the Italian, and the Iberian. The Iberian Peninsula includes Spain and Portugal; it lies between the Mediterranean on the east and the Atlantic on the west. It is separated from Africa by the Strait of Gibraltar, which is only eight miles wide in its narrowest part.

There are also many islands in the Mediterranean and its tributary seas.

Fig. 375. Europe in the glacial period

Fig. 376. Iron Gate. In the background are forest-covered mountains

382. Atlantic Coast Line.—The coast line in the west and north is as irregular as in the south. The Bay of Biscay is open to the Atlantic and has important seaports in northern Spain and western France. The English Channel connects the Atlantic Ocean and the North Sea and has a number of English and French ports on its shores. The North Sea has on its borders seven of the countries of Europe. It receives the Thames, the Rhine, and the Elbe, all rivers of great commercial importance. Through it sail the ships bound to or from the ports of London, Antwerp, Rotterdam, Bremen, Hamburg, and many other cities. The Baltic Sea is almost inclosed by lands. It receives many rivers, and since it is in a cool region, evaporation from its surface is small. Its brackish waters are only about one fourth as salt as those of the ocean. The least important of the great indentations is the White Sea, opening from the Arctic Ocean, but it has considerable commerce from northern Russia, through the port of Archangel.

The peninsulas of western Europe are Brittany, Denmark, and Scandinavia. The most important islands of the world are the British Isles. They have a very uneven coast line, with deep bays, bold headlands, and many great seaports. Most of the rivers of the British Isles, and of the North and Baltic Sea regions, have deep tidal mouths, or *estuaries*. Hence seaports like Hamburg, Antwerp, and London may be a long distance inland, and sea trade is made easy. In the north, Scotland and Norway are mountainous, and the mountains are cut by steep-sided valleys, in which deep fiords extend from a few miles to as much as a hundred miles within the highlands. Thus there are many quiet and safe waters for fishing and for the ships of commerce.

383. Rivers.—Four large rivers have their principal sources in the Alps. The largest of these is the Danube, which rises north of the Alps, but is joined by many rivers which flow northward from these mountains. It crosses or borders seven countries on its way to the Black Sea. The river passes between the Transylvanian Alps and the Balkan Mountains by a wonderful gorge called the Iron Gate (Fig. 376).

The Rhine, which rises in the Alps, flows northward across western Germany and the Netherlands, and has built a large delta on the edge of the North Sea. The river has been deepened and improved and now furnishes the highway for an enormous river trade. There are many large cities on its banks.

The Rhone rises under the Rhone Glacier in Switzerland, flows a long distance between ranges of the Alps, passes through the Lake of Geneva, and enters France. It then flows southward to the Mediterranean.

Many large streams flow southward from the glaciers and snow fields of the Alps, into Italy. Most of them join the Po, which pours its waters into the Adriatic Sea.

The central parts of the Russian lowland are somewhat higher than the surrounding lands (Fig. 373), and from this region long rivers flow out in several directions. The Volga, the largest of these, is more than 2000 miles long and flows to the Caspian Sea. The Black Sea receives the Don and the Dnieper. The Pechora and Dvina flow northward into the Arctic Ocean, and the Duna flows westward into the Gulf of Riga, which is a part of the Baltic Sea (Fig. 377). Nearly all the rivers of this group are important highways of trade.

Many important rivers enter the Atlantic Ocean between the Gulf of Riga and Gibraltar. The Vistula flows for most of its course through Poland on its way to the Baltic. The Oder, the Elbe, and the Rhine all have the larger part of their courses in Germany. Find on the map (Fig. 371) the great seaports which have grown up near the mouths of these streams. Three of the Atlantic rivers — the Seine, the Loire, and the Garonne — have their whole courses in France; and four smaller rivers are in Spain and Portugal.

The Thames, the Mersey, the Tyne, and the Humber are rivers of England, the mouths and lower courses of which have been improved to furnish harbors for ocean-going ships.

384. Fresh-water Navigation.—None of the European rivers equal in size the principal rivers of the Western Hemisphere. Even the Volga and Danube are small in comparison with the Amazon or the Mississippi. Many of the small European rivers, however, bear thousands of ships and barges laden with freight, for they flow through countries of dense population, and where it has been necessary they have been fitted for navigation by dredging the mud or blasting out rocks to make the channels deeper. Their navigation has also been made easier by the building of dams and locks to form a series of deep-water levels along their courses.

Many of the European rivers have been connected by canals. Canal boats can go by river and canal from Bordeaux on the Bay of Biscay to the Mediterranean Sea; or from Havre, Antwerp, or Rotterdam to the mouth of the Rhone. A boat can go from the North Sea up the Rhine, cross a small section of southern Germany by canal, and go down the Danube to the Black Sea. In eastern Europe boats can be sent from Archangel or Leningrad to Astrakhan on the Caspian Sea; or from Riga on the Baltic to Odessa on the Black Sea (Fig. 371).

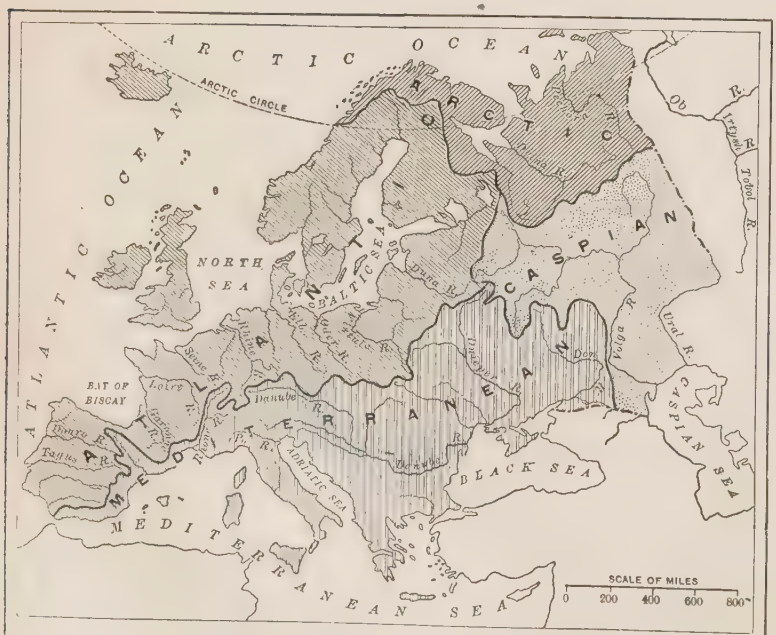

Fig. 377. Drainage basins of Europe

385. Climate of Central and Northern Europe.—For a continent that is so far north

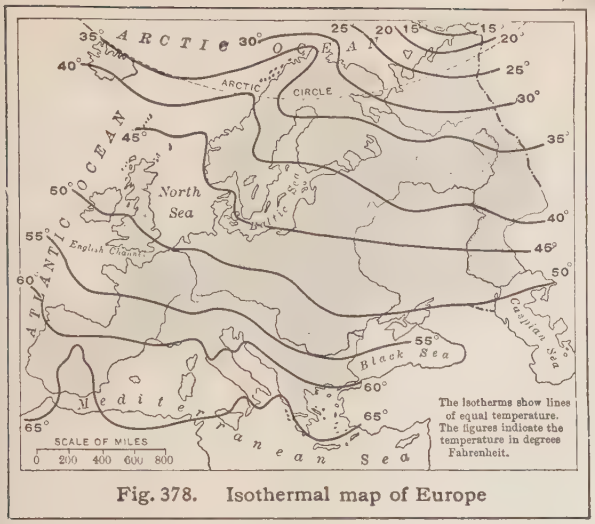

Fig. 378. Isothermal map of Europe

(Sec. 375), Europe has a warm climate. Its western coasts are washed by the mild Atlantic waters, which drift northward and keep the northern shores of Europe comparatively free from ice (Sec. 348). The westerly winds bring the temperatures of the ocean far inland into central Europe (Fig. 378). They can do this, because there are no high mountains in western Europe, as there are in western North America, to break their course.

Although ample rains fall on the west coast of Europe, sufficient moisture is left in the air to furnish rain for crops in central Europe (Fig. 379). If Europe had a continuous range of high mountains in the west, corresponding to those in the continent of North America, there would be a desert on their leeward (eastern) side. As we go east in Europe the winters are colder and the summers are warmer. In Russia the climate is continental, with moderate rainfall and extremes of temperature as the seasons change. Some of the far northern plains of Russia are treeless, moss-covered tundras.

386. Climate of the Mediterranean Slope.—The Mediterranean Sea tempers the extremes of both winter and summer; with its tributary seas it reaches in among the lands and makes them warmer in winter and cooler in summer than they would otherwise be.

The high mountain barriers everywhere on the north shut out the cold north winds. As a result the Mediterranean shore of France called the Riviera is sought by thousands who wish to escape the severe northern winters. The same is true of the Italian Riviera east and west of Genoa, where palms and oranges grow in the latitude of southern Maine, Toronto, and the Yellowstone National Park. Compare the climate and the agricultural products of this Mediterranean region with those of the northern part of the United States, which is in the same latitude.

Owing to the shifting of the wind belts, the Mediterranean region in winter is in the track of the westerly winds, and plentiful rains fall. In summer, however, when the belt of calms and the wind belts move northward, the Mediterranean region is in the

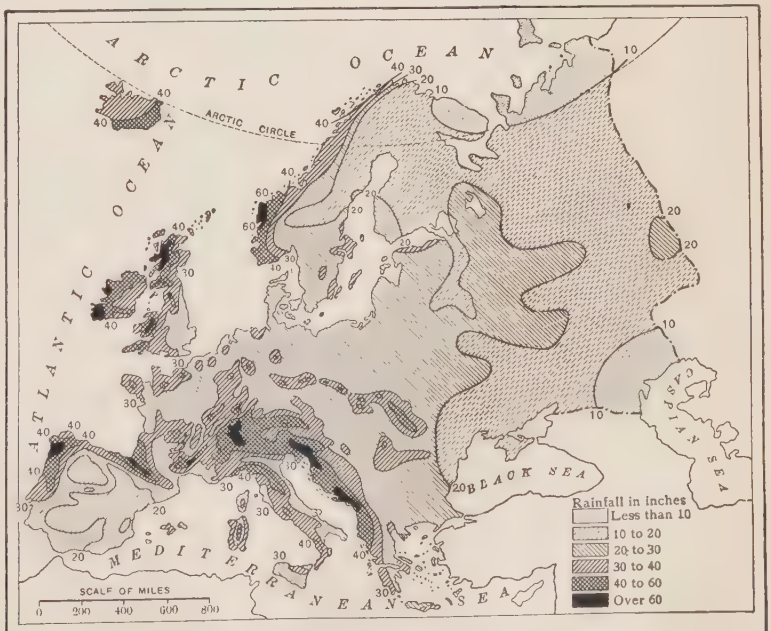

Fig. 379. Average annual rainfall in Europe

are caught in the adjacent waters. In recent years, however, the growth of population has been favored by the development of manufacturing. This has led to the importation not only of food but also of a variety of raw materials. The bays and land-locked seas have favored the growth of commerce, and a large part of the world's commercial fleet is manned by European sailors.

Fig. 382. St. Peter's and the Vatican, Rome

392. Religions. — In the Latin nations the prevailing religion is the Roman Catholic form of the Christian faith. There are also many Roman Catholics in Germany, Austria, Hungary, Czechoslovakia, Poland, Great Britain, and other countries of Europe. The home of the Pope and the seat of the papal government is the Vatican Palace in Rome. The majority of the Teutonic people are Protestants, while the Greeks, Russians, and some other peoples of eastern Europe hold to the ancient Orthodox form of Christian belief and worship. In southeastern Europe there are some Mohammedans.

Fig. 383. Lincoln Cathedral, England

393. The World War.—The war which began in August, 1914, involved all but six of the nations of Europe. Less than one seventh of the area of Europe and less than one eleventh of the population of the continent remained neutral. The war not only caused vast loss of life and property, but led to important territorial changes. Germany and Russia lost various parts of their domains, Austria-Hungary was dismembered, and several new nations were established (Fig. 371). To prevent future wars if possible, a League of Nations was formed, including most of the countries of the world.

394. Government.—Before the World War there were but three important republics in Europe. Switzerland has long had this form of government. France became a republic in 1871, and Portugal in 1910. All the other leading countries were *monarchies*. In some of these the rights of the people were fully protected by constitutions and lawmaking bodies like our Congress.

As a result of the war, Germany, Austria-Hungary, and Russia ceased to be monarchies. Most of the newly established nations of Europe adopted a republican form of government. Less than half the countries of the continent still remain constitutional monarchies as they were before the war.

395. Postal Union.—The countries of Europe, except Russia, have joined with the United States and other progressive nations in an International Postal Union. This union has an office in Bern, Switzerland, and a convention is held at intervals of a few years to arrange for quick and efficient mail service.

Fig. 384. Road cut into a mountain side, Switzerland

396. Money.—Most of the countries have their own special forms of money. The unit in British money is the pound, which is equal, usually, to $4.86 of our money. Gold coins of this value are called sovereigns and are accepted in almost all countries in payment of debts. In France and Switzerland the unit is the franc, usually worth nearly twenty cents, and in Italy it is the lira, which has the same value. The Germans use the mark, which normally is equivalent to twenty-four cents. The banks in all the principal cities will exchange foreign for home money, and travelers carry letters of credit, or negotiable checks, on which they can draw funds. Conveniences of this sort are very necessary in countries that wish to develop and encourage trade with foreign people.

397. Roads.—The common roads of Europe are better built than those of any other continent, and most of them are kept in constant repair. The building of good roads began in the time of the Romans, and some of the Roman roads are still in use. In the hundreds of years that have passed since the time of Roman rule, good roads have been built in all parts of the continent except in Russia and southeastern Europe. Good roads make travel much easier, and a team of horses can draw a much larger load over them than they can over the unimproved roads in many parts of our country. The roads are used also by an enormous number of automobiles and motor trucks.

398. Railroads and Steamship Lines.—Europeans are advanced in railroad building. They build the roadbeds so firm and run the trains with such care that there are fewer accidents than in America. In the United States, however, there is a greater mileage of railroads than in Europe, and some of the passenger trains are provided with more conveniences and luxuries than can be found on any European trains. The freight cars in America are much larger, and because of the great size of our country freight is usually hauled longer distances.

The greater part of the world's ocean shipping is controlled by European steamship companies, the largest of which belong to Great Britain.

OCCUPATIONS AND INDUSTRIES

399. Agriculture.—Several of the countries of Europe are densely populated. Some countries, as England and Belgium, have five or six hundred people on the average for each square mile. Much food is needed, and most of the good land, and much that is poor, is carefully cultivated.

More wheat is raised in Europe than in any other continent. All the Latin nations raise large crops, but it is all needed at home. Russia, however, and some of the other southeastern countries, raise more than they use, and have some for export. Rye and barley flourish in cool climates and are grown extensively in Germany, Russia, and some other northern countries. Much corn is

Fig. 385. Regions producing sugar beets

raised in Hungary, Rumania, and Italy, where the people use it chiefly for their own food rather than for fattening stock as in our country.

Germany raises more potatoes than any other country. Poland and Russia rank high, and even France, in some years, raises more than the United States. Potatoes form one of the chief food crops in Ireland. Sugar beets are grown throughout central Europe (Fig. 385). Germany leads in this industry and in normal times exports large quantities of beet sugar. Russia, Ireland, France, and Belgium all raise flax. The fiber of this plant is used to make linen, and the seed is used for the manufacture of linseed oil. The United States, Argentina, India, and Canada are the other leading countries in the production of flax.

400. **Fruit Raising.**—In western Germany there are many vineyards. In France there are vineyards in most parts of the country; and the grape-growing industry is important almost everywhere in Italy, Spain, and Portugal, and in many parts of southeastern Europe. Some of the grapes are eaten as fresh fruit, but most of them are used in the manufacture of wine, or are cured as raisins.

Subtropical fruits grow in the countries along the Mediterranean Sea. The most important of these are oranges, lemons, olives, figs, and a kind of currant that is really a small raisin. These currants form the leading export of Greece.

Mulberry trees are grown in Italy and France, because the leaves furnish the necessary food for silkworms. Small fruits and garden vegetables are raised in all parts of Europe to supply the people of hundreds of cities and thousands of smaller towns.

401. **Fishing.**—Among other means of supplying food, fishing is important. The waters of the continental shelf and of the numerous shallow seas are full of fish. The North Sea especially is a field for fishermen, and most of the countries around it have for centuries sent out fishing fleets. Thousands of their men are engaged in gathering food from the waters (Fig. 386). They have fished both in European waters and along the Atlantic coast of North America. Some European rivers also are regularly stocked with fish.

402. **Grazing.**—Another source of food is in the herds of cattle and sheep. In nearly all of Europe except the northern forests and tundras sheep are raised in great numbers, both for wool and for mutton; but the supply does not meet the demand, and much wool and mutton have to be imported from Australia and Argentina. All the European

Fig. 386. Norwegian fisherman arranging a net for salmon where the tides are high

countries raise cattle, and yet both beef and leather must be brought from North and South America, Australia, and New Zealand. Milch cows are kept, and butter and cheese are made, in nearly all the countries of Europe. Butter is an important product of Denmark, while Switzerland makes and exports many kinds of cheese. Much cheese is made also in Holland, France, and Italy.

403. **Forests.**—Spain, Italy, Greece, and other countries once had larger forests than now. The trees were carelessly cut away, and now the people need much more wood than they have, while the steep hillsides have lost their soil from heavy washing by rains and torrents. To repair the damage Germany and France have planted many trees, and these countries, with some others, now watch over the forests carefully. Cutting of timber is regulated by law, and precautions are taken to prevent fires. There is considerable timber in Norway, Sweden, and northern Russia. There are many wood-pulp factories in Norway and Sweden.

In most European countries wooden houses and barns are few, as timber is too valuable to use for building purposes, except for doors, window frames, sash, and interior finish. Brick and stone are used for the walls, and the roofs are covered with tiles. Many European cities, seen from a church tower or a mountain side, look red because this is the color of the roof tiles.

404. **Mining.**—Iron and coal are most necessary minerals, as they are extensively used in all lines of modern industry. They are mined in Great Britain, France, Belgium, and Germany, and iron is mined also in Sweden and Spain. Gold and silver are not found in large quantities, but the mines of tin, lead, zinc, copper, quicksilver, and salt are important. Clay pits and stone quarries have been worked for centuries, especially in regions where the people build chiefly with earth materials instead of wood

405. **Manufactures.**—Europe is the manufacturing center of the world. Many things are made as skillfully elsewhere, but no other continent has so many workers engaged in manufacture, or sells so many manufactured goods. Many of the raw materials they produce, and others they import. They cannot raise enough wool or silk for their factories, and they raise only a little cotton, but the money they receive for manufactured articles pays for their labor and buys more raw materials. Europe manufactures for the world, and Argentina, Australia, and Canada cultivate the soil and raise crops for the world. The United States is great both in manufacturing and in agriculture, but still it buys from Europe fine fabrics, artistic objects in gold, silver, and other metals, carved woodwork, toys, pictures, drugs, chemicals, and countless other things.

The great manufacturing nations are in western Europe. Russia devotes most of its labor to farming and buys the greater part of its finer manufactured goods. The people of the Balkan countries are backward and unskillful in most manufacturing.

Review.—1. What was the extent of the Roman Empire? 2. What are the Latin nations of to-day? 3. What are the Teutonic nations? 4. What races are found in eastern Europe? 5. How can a small continent support so large a population? 6. What are the principal republics of Europe? 7. Which of these recently became republics? 8. What other form of government is found in Europe?

9. What forms of Christian faith prevail in the several parts of Europe?

10. What is the unit of money in Great Britain? In France? In Germany? In Italy? 11. What are some of the differences between European and American railroads?

12. What are the principal grains raised in southern Europe? In northern Europe? 13. Where is wine culture important? 14. What vegetable products are much raised in Germany? 15. What countries produce the most from dairies? 16. Give an account of building materials in Europe. 17. Why is western Europe a great manufacturing region?

Fig. 387
Physical and Political
BRITISH ISLES
Scale of Statute Miles
0 25 50 75 100
87 MILES TO ONE INCH
Capitals
Principal Railroads thus:
ELEVATIONS IN FEET
2000 TO 5000
1000 TO 2000
500 TO 1000
SEA LEVEL TO 500
COPYRIGHT, BY AMERICAN BOOK COMPANY
SHETLAND ISLANDS
St. Magnus Bay
MAINLAND
FOULA
YELL
UNST
FETLAR
BRESSAY
Sumburgh Head
FAIR ISLE
NORTH RONALDSAY
WESTRAY
SANDAY
ORKNEY ISLANDS
HOY
SOUTH RONALDSAY
Pentland Firth
Duncansbay Head
Thurso
Wick
Ben Hope
Morven
Butt of Lewis
C. Wrath
Ben More Assynt
The Minch
WESTERN ISLANDS
LEWIS
HARRIS
N. UIST
Little Minch
S. UIST
BARRA
Sea of the Hebrides
RUM
Barra Passage
Ardnamurchan Pt.
COLL
TIREE
STAFFA
IONA
MULL
Firth of Lorne
COLONSAY
JURA
ISLAY
GIANTS CAUSEWAY
North Channel
K.NTYRE
ARRAN
Malin Head
Bloody Foreland
Moville
Lough Foyle
Londonderry
Donegal Mts.
Derrin Mts.
Larne
Stranraer
Belfast Lough
Mull of Galloway
Teelin Head
Donegal Bay
Bonderan
NORTHERN IRELAND
Lough Neagh
Belfast
Erris Head
Sligo Bay
Sligo
Ennniskillen
Armagh
Mts. of Mayo
Ballina
Mourne Mts.
ACHILL I.
Westport
Mask
Dundalk
Dundalk Bay
Drogheda
Central IRELAND
Slyne Head
Roscommon
Lough Corrib
Athlone
Lough Ree
Shannon R.
Dublin
Galway
Galway Bay
Tullamore
Dublin Bay
Kingstown
Plain of IRISH
Lough Derg
Wicklow Mts.
Wicklow
Loop Head
Limerick
Carlow
Kilkenny
FREE STATE
Tipperary
Tralee
Wexford
Dingle Bay
Killarney
Knockmaldown Mts.
Waterford
Carnsore Pt.
Lakes of Killarney
Carrantuohill
Cork (Cobh)
Queenstown
Cork Harbor
Kinsale Harbor
Bantry
Bantry Bay
Mizen Head
Cape Clear
FASTNET ROCK
ATLANTIC OCEAN
IRISH SEA
ISLE OF MAN
Douglas
Barrow
Lancaster
Fleetwood
Preston
Blackburn
Bradford
Leeds
Hull
Halifax
Huddersfield
Oldham
Bolton
Salford
Manchester
Liverpool
Birkenhead
Mersey R.
Spurn Head
Humber R.
Grimsby
Lincoln
Sheffield
Chester
Crewe
Hanley
Stoke upon Trent
Derby
Nottingham
Burton
Trent R.
The Wash
Cromer
Kings Lynn
Norwich
Great Yarmouth
Lowestoft
ENGLAND
Leicester
Birmingham
Coventry
Rugby
Northampton
Ouse R.
Cambridge
Ipswich
Harwich
The Naze
Bedford
Luton
Stratford on Avon
Worcester
Hereford
Gloucester
Oxford
Chiltern Hills
Thames R.
North Foreland
Canterbury
Dover
Folkestone
Greenwich
West Ham
London
Croydon
Reading
Windsor
Swindon
Stroud
Bristol
Bath
Newport
Swansea
Cardiff
Brecon Beacons
Merthyr
Severn R.
Wye R.
Ouse R.
Aldershot
North Downs
Trowbridge
Salisbury
Winchester
Taunton
Southampton
South Downs
Hastings
Brighton
Portsmouth
ISLE OF WIGHT
Bournemouth
Weymouth
Lyme Bay
Portland Bill
Exeter
Dartmoor
Devonport
Plymouth
Penzance
Lands End
Falmouth
Eddystone Lighthouse
SCILLY IS.
LUNDY I.
Bristol Channel
Carmarthen Bay
St. Davids Head
Fishguard
Carmarthen
Pembroke
Cardigan
Cardigan Bay
St. Georges Channel
Holyhead
Carnarvon
Carnarvon Bay
Snowdon
ANGLESEY
Menai Str.
Conway R.
Llandudno
Rhyl
Dee R.
Chester
Wrexham
Shrewsbury
Severn R.
Welshpool
Newtown
Kidderminster
Wolverhampton
Aberystwyth
Llanidloes
Rhayader
Builth
Llandrindod
Hereford
Ross
Monmouth
Wye R.
Severn R.
Berwick on Tweed
Tweed R.
Tynemouth
South Shields
Sunderland
Gateshead
Newcastle
Tyne R.
Hartlepool
Middlesbrough
Darlington
Scarborough
Flamborough Head
York
Ouse R.
Derwent R.
Humber R.
Pennine Chain
Cheviot Hills
Cumbrian Mts.
Carlisle
Workington
Whitehaven
Solway Firth
Dumfries
Galashiels
Hawick
Edinburgh
Leith
Berwick on Tweed
Firth of Forth
Fife Ness
Firth of Tay
Dundee
Arbroath
Montrose
Perth
Kinross
Stirling
Dunfermline
Forth R.
Tay R.
Firth of Clyde
Greenock
Paisley
Glasgow
Hamilton
Kilmarnock
Ayr
Galashiels
Hawick
Cheviot Hills
Tweed R.
Solway Firth
Carlisle
Workington
Whitehaw
Cumbrian Mts.
Scafell Pike
Isle of Man
Douglas
Barrow
Lancaster
Fleetwood
Preston
Blackburn
Bradford
Leeds
Hull
Halifax
Huddersfield
Oldham
Bolton
Salford
Manchester
Liverpool
Birkenhead
Mersey R.
Spurn Head
Humber R.
Grimsby
Lincoln
Sheffield
Chester
Crewe
Hanley
Stoke upon Trent
Derby
Nottingham
Burton
Trent R.
The Wash
Cromer
Kings Lynn
Norwich
Great Yarmouth
Lowestoft
ENGLAND
Leicester
Birmingham
Coventry
Rugby
Northampton
Ouse R.
Cambridge
Ipswich
Harwich
The Naze
Bedford
Luton
Stratford on Avon
Worcester
Hereford
Gloucester
Oxford
Chiltern Hills
Thames R.
North Foreland
Canterbury
Dover
Folkestone
Greenwich
West Ham
London
Croydon
Reading
Windsor
Swindon
Stroud
Bristol
Bath
Newport
Swansea
Cardiff
Brecon Beacons
Merthyr
Severn R.
Wye R.
Ouse R.
Aldershot
North Downs
Trowbridge
Salisbury
Winchester
Taunton
Southampton
South Downs
Hastings
Brighton
Portsmouth
ISLE OF WIGHT
Bournemouth
Weymouth
Lyme Bay
Portland Bill
Exeter
Dartmoor
Devonport
Plymouth
Penzance
Lands End
Falmouth
Eddystone Lighthouse
SCILLY IS.
LUNDY I.
Bristol Channel
Carmarthen Bay
St. Davids Head
Fishguard
Carmarthen
Pembroke
Cardigan
Cardigan Bay
St. Georges Channel
Holyhead
Carnarvon
Carnarvon Bay
Snowdon
ANGLESEY
Menai Str.
Conway R.
Llandudno
Rhyl
Dee R.
Chester
Wrexham
Shrewsbury
Severn R.
Welshpool
Newtown
Kidderminster
Wolverhampton
Aberystwyth
Llanidloes
Rhayader
Builth
Llandrindod
Hereford
Ross
Monmouth
Wye R.
Severn R.
Berwick on Tweed
Tweed R.
Tynemouth
South Shields
Sunderland
Gateshead
Newcastle
Tyne R.
Hartlepool
Middlesbrough
Darlington
Scarborough
Flamborough Head
York
Ouse R.
Derwent R.
Humber R.
Pennine Chain
Cheviot Hills
Cumbrian Mts.
Carlisle
Workington
Whitehaven
Solway Firth
Dumfries
Galashiels
Hawick
Edinburgh
Leith
Berwick on Tweed
Firth of Forth
Fife Ness
Firth of Tay
Dundee
Arbroath
Montrose
Perth
Kinross
Stirling
Dunfermline
Forth R.
Tay R.
Firth of Clyde
Greenock
Paisley
Glasgow
Hamilton
Kilmarnock
Ayr
Galashiels
Hawick
Cheviot Hills
Tweed R.
Solway Firth
Carlisle
Workington
Whitehaw
Cumbrian Mts.
Scafell Pike
Isle of Man
Douglas
Barrow
Lancaster
Fleetwood
Preston
Blackburn
Bradford
Leeds
Hull
Halifax
Huddersfield
Oldham
Bolton
Salford
Manchester
Liverpool
Birkenhead
Mersey R.
Spurn Head
Humber R.
Grimsby
Lincoln
Sheffield
Chester
Crewe
Hanley
Stoke upon Trent
Derby
Nottingham
Burton
Trent R.
The Wash
Cromer
Kings Lynn
Norwich
Great Yarmouth
Lowestoft
ENGLAND
Leicester
Birmingham
Coventry
Rugby
Northampton
Ouse R.
Cambridge
Ipswich
Harwich
The Naze
Bedford
Luton
Stratford on Avon
Worcester
Hereford
Gloucester
Oxford
Chiltern Hills
Thames R.
North Foreland
Canterbury
Dover
Folkestone
Greenwich
West Ham
London
Croydon
Reading
Windsor
Swindon
Stroud
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Aberystwyth
Llanidloes
Rhayader
Builth
Llandrindod
Hereford
Ross
Monmouth
Wye R.
Severn R.
NORTH SEA
ENGLISH CHANNEL
Strait of Dover
Calais
Beachy Head
Dieppe
Cherbourg
Havre
ALDERNEY
CHANNEL ISLANDS
GUERNSEY
JERSEY
FRANCE
THE MATTHEWS-NORTHRUP WORKS, BUFFALO, N. Y.
Longitude West 6° from Greenwich 4°

Fig. 388. Newcastle on Tyne, from the river; a great center of coal mining, manufacture, and commerce

THE BRITISH ISLES

	Area, Sq. Mi.	Population	Capital
Great Britain, etc.	89,030	42,918,000	London
Northern Ireland	5,320	1,250,000	Belfast
Irish Free State	27,040	3,140,000	Dublin

Map Study.—1. What is the latitude of Lands End? Of the Shetland Islands? What part of North America is included between these latitudes?

2. What waters separate Ireland from England and Scotland? 3. On what river is Liverpool in northwestern England? 4. On what waters are Dublin and Belfast in eastern Ireland? 5. What indentations of the Scottish coast lead to the cities of Glasgow and Edinburgh?

6. Locate the following seaports: Newcastle and Hull, in eastern England; Southampton and Bristol, in southern England; and Cardiff, in Wales. 7. Locate Birmingham, Sheffield, Leeds, and Manchester, in central England.

8. Give the position and direction of the Pennine Chain. 9. Locate the Strait of Dover, and use the scale of miles to ascertain its width.

406. Names and Position.—The British Isles include two large islands and many smaller ones, with a total area greater than that of New England and New York together. For a long time these islands were united under one government as the United Kingdom of Great Britain and Ireland. Early in 1922, however, most of Ireland was organized as the Irish Free State with its own government. Great Britain consists of England, Wales, and Scotland, and, with Northern Ireland, constitutes the United Kingdom.

Because of its island position, Great Britain has never kept as large a standing army as several of its continental neighbors. It has always maintained a powerful navy, however, as well as a great merchant marine, for otherwise ships of a hostile nation could cut off its food supply and stop its trade with foreign countries, as was attempted during the World War. Many of the people of these islands have been sailors, explorers, and traders in all parts of the world; and even after the destructive World War Great Britain has more ships than any other country.

France is only twenty-one miles from England across the Strait of Dover, and by short voyages from British or Irish ports passengers and goods may reach Norway, Sweden, Denmark, Germany, the Netherlands, and Belgium. It takes but a few days for ships to go from these islands to American or Mediterranean ports. Swift steamers cross the English Channel and the North Sea and connect the railways of the islands with those of the continent. Quick railway journeys to Paris, Rome, Berlin, Constantinople, and Moscow are thus made possible. Great Britain is centrally located among the great trading nations of the world.

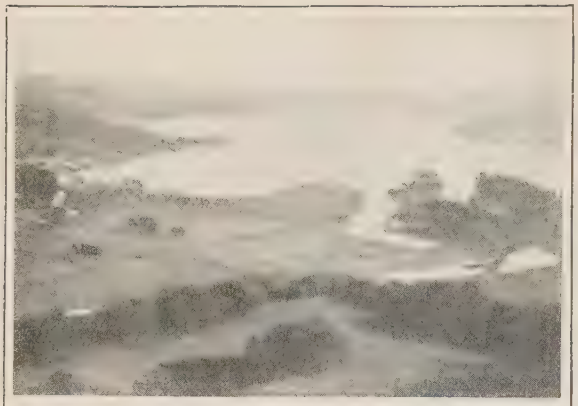

Fig. 389. Windermere, one of the lakes in the English Lake district

GREAT BRITAIN

407. Surface.—England and Wales have highlands in the west and north. Wales is a region of low mountains and of many valleys. The highest point is the top of Mt. Snowdon, 3570 feet above the sea. The peninsula between the English Channel and Bristol Channel is an upland, and the English lake district, in the northwest, on Solway Firth and the Irish Sea, is mountainous (Fig. 389). The Pennine Chain is a range of low mountains running north and south through the middle of northern England. Central and southeastern England is a lowland which is flat in some parts and hilly in others. A part of the lowland between the mouth of the Humber River and the Wash is so low that banks are built to keep out the sea and the area is drained by pumps. The country is small and the rivers are short, but many have been made navigable by dredging and the use of dams and locks.

The Highlands of Scotland are in the central and northern part of that country. As a whole this region is rocky and barren; Ben Nevis, 4406 feet in altitude, is the highest mountain in the British Isles (Fig. 390). The southern part of Scotland also is a highland, but it is not so high or rugged as the northern part. Between the highland in the south and the Highlands of the north is the Scottish lowland. The Firth of Forth and the Firth of Clyde are deep indentations in the east and west, and along their shores and between their heads are fertile lands and large deposits of coal and iron. Here on the river Clyde is Glasgow, the largest city in Scotland and the second largest in Great Britain, and near the Firth of Forth is Edinburgh, the famous old Scottish capital.

408. Climate.—Because of its position, Great Britain has an oceanic climate, with no extremes of temperature (Sec. 385). The winters are not severe, and the snow that falls does not remain long. In fact it is possible to do out-of-door work throughout the year. American visitors find the midsummer days cool enough to be very comfortable, though the Englishmen may call them hot.

On the Scilly Islands, a small group off Lands End, the climate is so mild that the chief business is the raising of flowers, bulbs, and early vegetables for the city markets. In the western highlands of Wales, England, and Scotland the rainfall is heavy and grass grows abundantly. In the Highlands of Scotland especially the rainfall is so frequent and heavy that agriculture is not profitable, but there are fine pasture lands and many of the people are shepherds. In eastern England the rainfall is only about 25 inches a year; and yet the fields and gardens there

Fig. 390. Ben Nevis, Scotland

Fig. 391. Farms in Scotland

are green and fresh through the summer, because there is no great heat to dry the ground and wither the plants.

409. Agriculture. — In spite of the care with which the soil is tilled, British farmers raise only a small part of the food needed by the British people. In the south and east of England, where the rainfall is least abundant and the winters cool, much wheat is grown, an average of 32 bushels per acre being maintained. This is much more than is usually produced on an acre in the United States. Yet the population of Great Britain is so dense that it has to import the greater part of its wheat and flour from the United States, Canada, Argentina, and other lands.

In the more moist portions of England and in the Scottish lowlands, barley and oats and many potatoes are raised because they thrive in a cool, moist climate in which wheat will not ripen (Fig. 391). Immense quantities of garden vegetables are also raised in various parts of the country, and root crops, such as turnips and mangels (a kind of beet), are raised as food for stock. Corn does not thrive, because the summers are too cool.

A considerable part of the more rainy portion of the island is in meadow and pasture. Cattle, sheep, horses, and hogs are numerous. The dairy industry is very large, but not enough butter and cheese are produced to supply the needs of the population and some must be imported. Young cattle are imported from Ireland to be fattened for market in English pastures. British mutton has a reputation for its excellent quality. English agriculture has improved since the World War, largely because the higher prices of agricultural produce have made it profitable to bring under cultivation land that had been left idle or used only as pasture.

The fields in Great Britain, as in many other parts of Europe, are very carefully cultivated. The roads are narrow and winding, and roads, fields, and railways are commonly bordered by neat hedges. Many trees grow in the meadows and pastures, and buildings and walls are often covered with graceful, luxuriant growths of ivy. The soft, rich green of grass and trees and the well-kept fields and roads make the English countryside (or rural England) very beautiful.

410. Metropolitan and Industrial England.—London is the metropolis of the kingdom and the center of many railways leading to all parts of England, Wales, and Scotland. The district south of a line drawn from the Wash on the east to the Bristol Channel on the west is the great farming region of England; but it is commonly called metropolitan England because its only very large city and trade center is the metropolis London.

North of the line described lies industrial England, so called because the people are mainly devoted to the manufacturing industry. Here are all the very large cities of England except London, and in this district practically all the work in iron, woolen, and cotton is carried on. Great Britain is chiefly known for its manufacturing. If this industry and the income from shipping did not furnish money to buy food and raw materials of many kinds in foreign lands, Great Britain might not be able to support more than a third of its present population.

Fig. 392. Coal fields, and principal industrial centers and ports of Great Britain

411. Iron and Coal.—Great Britain could never have taken such a lead in the world's affairs without its large supplies of coal and iron (Fig. 392). One of the great coal fields of England is about Newcastle, on the Tyne (Fig. 388), in the north of England. This city not only exports coal, but makes iron and steel and builds some of the largest steel ships that cross the oceans. Another great coal field is in Yorkshire, east of the Pennine Chain. This supplies coal for the iron and woolen industries of Sheffield, Leeds, and many other cities. Sheffield has made fine grades of steel for hundreds of years, including the finest pocket knives, shears, and other kinds of cutlery.

Other coal fields are found in central England, near Birmingham. This is one of the chief cities of England, and its special industry is the working of iron. Here and in the neighboring towns there are so many chimneys, coal pits, and heaps of waste that the region is called the "black country." It is very different from the clean and quiet parts of rural England which lie around it. The "forest of Arden" formerly surrounded Birmingham, and the people made charcoal and used it in little shops, to work the iron. Now most of the work in iron and steel is done in factories which turn out pens, nails, screws, and needles by the million, as well as all kinds of machinery.

There is one other important coal field in England, in the county of Lancashire, west of the Pennine Chain. It is the region about Liverpool, the great port, and Manchester, the chief center of the cotton industry.

A large supply of coal is found in the South Wales coal field. This coal is taken to Cardiff, the principal seaport of Wales, on Bristol Channel; much is used there in the iron furnaces, and much is exported. Cardiff is the principal coal-exporting city of the world. British ships carry coal to sell in France, Italy, Argentina, and many other foreign countries, and to supply coaling stations which Great Britain owns in various parts of the world, including Gibraltar, Malta, the Bermudas, St. Helena, and the Fiji Islands. Such coaling stations are necessary because even the largest ships carry only coal enough to go a few thousand miles.

Coal fields in the Scottish lowlands provide a convenient supply of fuel for Glasgow and other manufacturing cities in Scotland.

Many deposits of iron are close to the coal beds in England and Scotland, and much is brought in ships from Sweden, Spain, and other countries. Modern building, manufacturing, and transportation both by land and by sea, require the use of iron and steel in great quantities. Great Britain has iron for ships, tools, railroads, and machinery, and the coal to work the iron, drive the ships, and run the factories. These two minerals have done much to make Great Britain the greatest manufacturing nation of the world, even in industries for which the raw material must be brought from distant lands.

412. Cotton Manufacture.—The manufacture of cotton goods is the largest industry in Great Britain, and yet every fiber of the raw material must be imported. The United

Fig. 393. Manchester ship canal, bordered by wharves

States supplies more cotton than any other country, though much comes from Egypt and India. Much of the cotton is brought by sea to Liverpool and then sent by rail or boat to the manufacturing towns in Lancashire. Manchester is the greatest city in the cotton district, and is the money and banking center for the cotton trade. The city of Manchester has dug a ship canal $35\frac{1}{2}$ miles long and 28 feet deep from Manchester to the sea (Fig. 393), so that cotton and other freight can reach the city without stopping in Liverpool.

About two fifths of all the cotton spindles of the world are in England, and more than half of the product, in value, is turned out by English mills. There are several reasons for the greatness of the industry.

(1) Englishmen first invented the machinery that was needed. More than one hundred years ago two men, named Hargreaves and Arkwright, invented machines for spinning cotton, which made it possible to turn out more and better goods and thus decrease their cost. In those days woolen manufactures were much more important than those of cotton, but now the cotton industry is much the larger of the two. At first the workmen were very angry over the inventions of Hargreaves and Arkwright, because they feared that the machines would enable a few men to do the work and that many men would have no employment. The demand for cotton manufactures has so increased in all parts of the world, however, that now far more workmen find employment than before.

(2) Lancashire, the great cotton-spinning region, is in the rain belt of western England (Secs. 385, 408), and the moist air is favorable to working the delicate fibers of the cotton (Fig. 394).

(3) The manufacturing region is favorably located for ocean trade. The estuary of the Mersey allows large ships to reach Liverpool, so that the cotton is brought by water close to the mills, and a short haul carries the cotton goods back to the sea again.

(4) The enterprise of the British people has led to the development of trade with all parts of the world. Even the United States, which raises and manufactures so much cotton, buys some English cotton goods. Raw

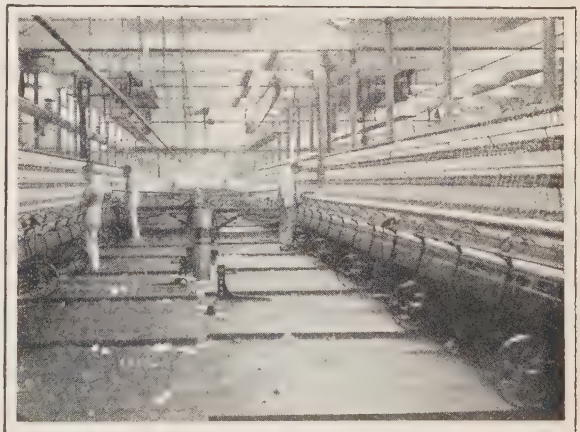

Fig. 394. Spinning room in a Lancashire cotton mill

cotton may be sent from Texas fields to England, there made up into cloth, and finally sent back to Mexico, to be sold just across the Rio Grande from the state in which it was grown. At the same time the breadstuff for the operatives comes to Liverpool from North America, Argentina, Egypt, and other countries, while cattle and beef and dairy supplies are shipped in from Canada, Argentina, Australia, and New Zealand.

413. Woolen and Other Manufactures.—Leeds is the center of woolen manufacture, and other cities near it have a share in the industry. All these cities are near the Yorkshire coal fields, which furnish the power to run the machinery. Woolen manufacture began there because sheep were kept on the pastures of the Pennine Chain. Now, although Great Britain still has many sheep and produces much wool, more than three fourths of the wool needed in its factories is imported. Australia sends the most, while Argentina and South Africa send some.

Fig. 395. Shaping pottery by use of the potter's wheel

There is a great demand for British woolen goods. Many kinds of woolen cloth are brought from Great Britain and sold in American stores and tailor shops. One of these is worsted, which took its name from a village of that name in eastern England. Another is the tweeds, which are made at a number of places in the lowlands of Scotland. Broadcloths, cashmeres, merinos, and serges also are made of wool, as are likewise many kinds of the best carpets.

The most important manufactures in Great Britain are those of iron, cotton, and wool; but there are many others. In addition to the making of cotton and woolen cloth, the textile industries of the country include some manufactures of silk and of linen. The making of pottery, including fine china, is another British industry (Fig. 395). There are many breweries, distilleries, and factories for making jams and marmalades, which are favorite articles of diet in Great Britain.

414. Commerce.—Great Britain usually has a larger foreign commerce than any other country; but since Great Britain is small and has less than half the population of the United States, its internal or domestic trade is much less than ours. Most of the British foreign trade is carried in British ships; and these, as well as many ships for other countries, are built in the shipyards of Great Britain. Newcastle (Sec. 411) has the largest shipyards of England, but Glasgow, together with the bank of the lower Clyde, is one of the chief shipbuilding districts of the world.

Great Britain has many seaports. Like other parts of Europe, it has an irregular coast line, with numerous bays and tidal rivers or estuaries. The water of a number of these rivers is deep enough for ships to go many miles into the country. No place in the country is more than 70 miles from a seaport. This gives the manufacturers an advantage, for it costs less to carry goods by ship than by rail. In the United States it is not unusual to carry manufactured goods 500, or 1000, or even 2000 miles by railroad.

Fig. 396. Liverpool landing stage

Fig. 397. British shipping at London

There are four principal ports on the west coast. The second in size, but first in commerce, is Liverpool, on the river Mersey (Fig. 396). No other foreign city has so great a trade with the United States. Ships run to Boston, New York, Philadelphia, and many other ports. Cotton ships dock here from Galveston, New Orleans, and Savannah. From Liverpool ships go to all the British colonies and to all other countries. Not only the cotton, but most of the grain and meat from foreign countries enters Great Britain here. The wheat prices for the world are fixed chiefly by the condition of the Liverpool market.

First in size, but second in commerce, of the western ports is Glasgow. It has not only shipyards, but also factories for making locomotives, and is the great center and outlet for the products of the Scottish lowland. Ships sail between Glasgow and American ports, and some of them call at Londonderry, in the north of Ireland.

Bristol and Cardiff are also important seaports, though neither of them ranks with Liverpool or Glasgow.

There are three principal ports on the English Channel: Plymouth, Portsmouth, and Southampton. Plymouth has long been a British naval station, Portsmouth has the largest of the government navy yards, and Southampton is a convenient port for London. Many English ships sailing from New York have their terminal there, and some ships of other nations call there on voyages to and from America.

The mails between Great Britain and the United States are sent mainly through Southampton, Plymouth, and Liverpool. The larger steamships carry mails between Southampton and New York. Other fast ships leave American mails at Plymouth to be sent by train to London. Many of the slower steamships ply between New York and Liverpool, handling Irish mails at Queenstown (Cobh) in the south of Ireland.

England has three first-class ports on its east shores. One is Newcastle on the Tyne (Sec. 411). Another is Hull (Fig. 398), on the Humber, an outlet for the iron and woolen manufactures of Sheffield, Leeds, and other cities, with lines of ships that run to North Sea and Baltic ports and to many other parts of the world. The third and by far the most important port is London (Sec. 416).

415. **Fishing.**—As Great Britain is surrounded by water, fishing has become an important industry both along the coast and offshore, where such food fish as cod, haddock, and herring are taken in great numbers.

Fig. 398. Fish wharves at Hull

Approximately 70,000 men from Great Britain are engaged in this occupation. Many seaports share in this industry, though much of it has been concentrated at a few large ports on the North Sea. Among these are Hull (Sec. 414), Grimsby, and London in England, and Aberdeen in Scotland. Fresh fish are carried from these ports to market by fast trains and form a large part of the food supply in many parts of the country (Fig. 399).

Fig. 399. Sorting fish for market

416. London.—London is the capital of Great Britain and of the British Empire, and is the largest city of the Old World. The center of London is on the river Thames, fifty miles from its mouth. The place is an excellent site for a city, because it is at the head of the tidewater, and even before the time of the Romans in Great Britain, it was a convenient place for crossing the river. King Alfred the Great made London the capital of England more than a thousand years ago. The city has grown up on both sides of the river, though most of the important streets and buildings are on the north side. London Bridge is the oldest of several bridges that now join the two parts of the city.

London is the center of British railways. They run out in all directions to the principal seaports and to Scotland. Trains are swift, and no one is allowed to cross the tracks at stations or to walk on them in the country. More railroad tickets are sold each year in Great Britain than in the United States, but the average length of each journey is less.

Every British citizen thinks much about London and talks about "going up to London." This is because the city is so great and the land so small. London has about one sixth of the population of Great Britain.

London leads all other cities in its commerce. Its docks stretch down the Thames more than twenty miles, and the cargoes unloaded there come from all parts of the world. They are brought here, not only for use in Great Britain, but to be reshipped to many other ports, for Great Britain is a great trading nation and London a great trading center. Tea, coffee, spices, sugar, petroleum, wool, rubber, and hides are among the imports, some of which are again exported. The export trade is smaller than the import trade, because the chief manufacturing district is in the north of England, nearer Liverpool and

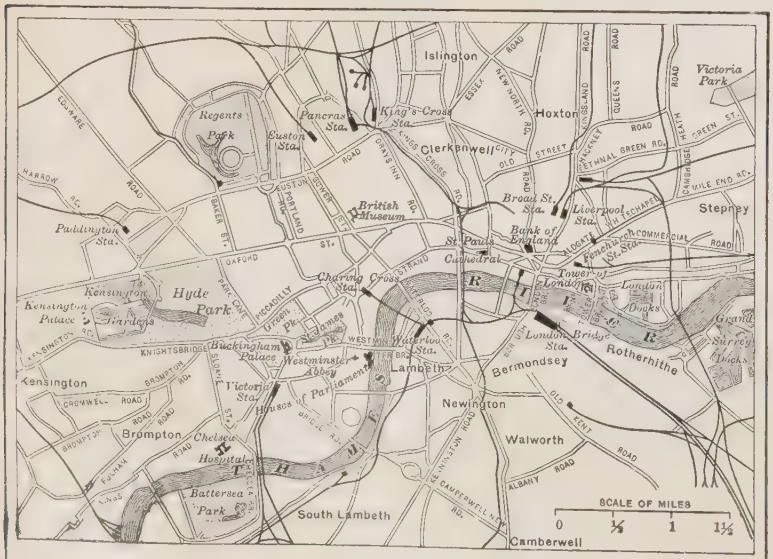

Fig. 400. The central part of London

Hull. London, however, is a great manufacturing center, with automobile works and many factories.

London has long been a money center, not only of the British Empire, but of the world. Much of the business is conducted through the Bank of England. The money transactions of New York, however, now exceed those of London.

London, like other European cities, does not allow very high store or office buildings to be erected, such as we see in some of our own cities. Many of the streets are narrow and crowded and not suited to railroad tracks. Most of the public travel is by taxicabs and huge omnibuses. There are extensive subways also, which the Londoners call "tubes."

Fig. 401. Greenwich Observatory

Fig. 402. Trafalgar Square, London

Among the great buildings are St. Paul's Cathedral and Westminster Abbey. In the Abbey are buried many famous British statesmen, writers, heroes, and men of science. The Tower is a great square building on the Thames, in which, in former centuries, many famous men of the kingdom were imprisoned, and some of them executed. The British Museum has vast collections in art and science, and one of the two largest libraries of the world, the other one being the National Library in Paris. In the eastern part of London, on the river Thames, is the Greenwich Royal Observatory, from whose meridian longitude is usually reckoned in all countries (Fig. 401).

Fig. 403. One of the colleges at Oxford—Christchurch

Only a short journey from London are the largest and most ancient of the British universities, Oxford (Fig. 403) and Cambridge. There are universities also at London, Sheffield, Manchester, Liverpool, Edinburgh, and other places.

417. Government and Colonies.—The form of government in Great Britain is now such that the people have almost entire control, while the king and the nobles have little power. The House of Commons is made up of members elected by the people, and is the chief source of legislation. The House of Lords is composed of members of the nobility and the bishops of the established church —the Church of England. The two houses

form the *Parliament* of the kingdom (Fig. 404). The king appoints as *Premier* the leader of the party in power, and the Premier selects a *ministry* of leading statesmen for the management of the departments of government.

Fig. 404. Houses of Parliament, London, where the Parliament meets

In the early days of America Englishmen founded several colonies, including Virginia and Massachusetts. Many Scotch, Irish, and Welsh people also came here in order to have religious freedom, or a better opportunity to earn a living.

At the time of our Revolutionary War Great Britain lost the colonies which formed the United States. But British colonies have at various times been established in other parts of the world, and are still members of the British Empire. While some of these have their own governments and are almost independent, they favor Great Britain in trade and in other ways.

In America, the empire includes Canada, Newfoundland, British Honduras, and British Guiana, besides Jamaica and several smaller islands of the West Indies. There are important British colonies in several parts of Africa, and in southern Asia. Australia and New Zealand and many smaller islands in the Pacific, Atlantic, and Indian oceans are under British rule. British possessions are so extensive (Fig. 350) that it is a common saying that the sun never sets on the British flag. The sons of British families go out and manage the farms, tend the ranches, work the mines, build the cities, and organize the governments of the colonies. For this reason the ideas and books, the commercial enterprise and ingenuity, of the English people are now found in all parts of the world. The English language is spoken by more people than any other European tongue.

Review.—1. What advantage has Great Britain from its island position? 2. Describe its surface and climate.

3. In what parts of Great Britain are wheat and oats chiefly raised? 4. Where is metropolitan England? Why is it so called?

5. Locate the chief coal fields of Great Britain. Name the chief cities which are dependent on them for fuel for their manufactures. 6. What advantages for cotton manufacture has the Lancashire district? What countries supply the raw material for this manufacture? 7. What is the leading city in English woolen manufacture? What countries supply the raw wool?

8. What is the principal center for shipbuilding in England? In Scotland? 9. Give an account of Liverpool; of Southampton; of Hull.

10. Describe the location of London and state its advantages. 11. What is the character of the commerce of London? 12. Why is Westminster Abbey a noteworthy church?

13. Describe the government of Great Britain. 14. What is the extent of the British Empire?

IRELAND

418. Irish Free State, and Northern Ireland.—Most of the people of Ireland have long objected to English rule. In 1922, after conferences between representatives of the Irish people and the British government, it was arranged to divide the island into two parts. A small region in northeastern Ireland remained with Great Britain in the United Kingdom, but the rest of the island was formed into the Irish Free State, with a government like that of Canada or Australia.

Taken as a whole, Ireland has low mountains on its borders, but in the central part there are low plains, suitable for meadows, pasture lands, and for some crops. Some of the best farming land is in Northern Ireland, where crops of hay, oats, barley, flax, potatoes, and roots are large and a fine grade of grass seed is grown.

Fig. 406. Hay field near Killarney, Ireland

Northern Ireland is the chief flax-growing region of the island, because the plant thrives in a cool climate. In preparing the flax the plants are pulled, dried, and the seeds removed. They are then put into pools of soft water to loosen the fibers and make it possible to comb them out and get them ready for weaving. Much of the fiber goes to Belfast, where it is made into linen. The best Irish linens are very beautiful and bring high prices. Belfast is noted also for its great ship yards, where large ocean ships are built (Fig. 405).

The Irish Free State is largely an area of grass land, with grazing and dairying as the chief industries (Fig. 406). It is this region that furnishes the young cattle sent to England to be fattened. There is some farming in the southern section of the country, but much of the land has been impoverished by poor farming methods and the returns are not large. In the western part, where the population is dense, most of the land under cultivation has been won from bog or mountain.

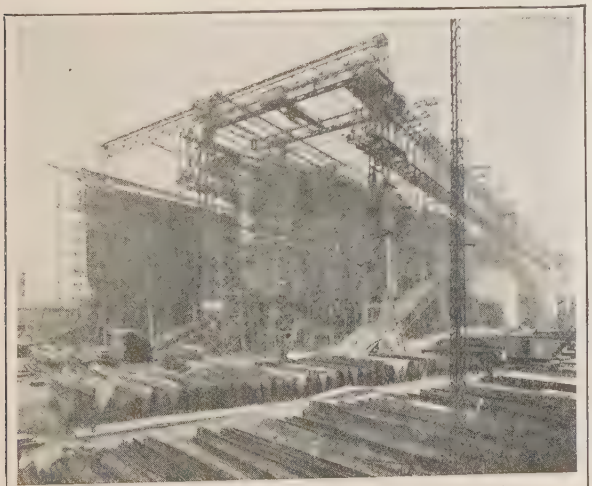

Fig. 405. Shipbuilding, Belfast. Two vessels on the stocks, in process of building

There is but little coal in Ireland and therefore but little manufacturing. Many of the people depend upon peat for fuel. In the swampy lands, of which there are many in the low-lying parts of this island with a heavy rainfall, mosses and other plants have grown freely. As the country is never hot or dry, the moisture of the swamps prevents decay, and in time the plants form a brownish vegetable substance called peat. This peat when cut out in blocks and thoroughly dried burns well and is extensively used as a domestic fuel.

Dublin is the chief city of the Irish Free State and has become an important ship-building and brewing center. In recent years it has grown rapidly in size, even while the country districts have been gradually losing in population.

Review.—1. What is Northern Ireland? What crops are grown there? 2. How is flax prepared for spinning? 3. In what city is linen chiefly manufactured? 4. What are the chief industries of the Irish Free State? 5. Where is the farming region of the Free State? 6. What is peat and for what is it used? 7. Where is Dublin, and what industries are carried on there?

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Fig. 408. Docks at Hamburg, the chief German seaport

GERMANY

AREA, 179,500 sq. mi. POP., about 60,000,000. CAPITAL, Berlin.

Map Study.—1. Name in order the countries that border Germany on the north, west, south, and east. 2. Describe the courses, in Germany, of five important rivers. 3. What are the latitudes of Berlin and of Washington? 4. Name the leading seaport on the Elbe River; three Baltic Sea ports. 5. Locate Breslau, Leipzig, and Dresden. 6. Locate Munich and Nuremberg. 7. What seas are joined by the Kiel Canal?

419. Physical Geography.—Northern Germany is a plain sloping from altitudes of a few hundred feet down to the North and Baltic seas. All the greater rivers of Germany, except the Danube, flow northward across this plain, which extends from the Netherlands on the west through Russia on the east.

Middle Germany consists of hills and low mountains, some of which are covered with forests. In southern Germany the Danube and its branches cross the Bavarian Plateau, while farther west are the Black Forest and the valley of the middle Rhine. On the southern border the country includes a part of the Alps, with summits nine or ten thousand feet high.

Germany has land boundaries on the west, south, and east. On the north is Denmark, but the rest of the northern border is a part of the shore line of the Baltic and North seas.

The climate is not so moist or so even as that of Great Britain, nor is the country so dry or subject to such extremes of heat and cold as Russia. The western parts of Germany have more rain and milder temperatures than the eastern parts. Southern Germany, on account of its greater elevation, is no warmer than the northern half of the country. Like Great Britain and like most of central and northern Europe, Germany is cloudy in winter, while bright days prevail in Italy.

The northern plain, which was covered by the ice-sheet (Sec. 379), has many lakes, sand flats, and moraine hills. As southern Germany was at one time covered by ice moving northward from the Alps, this region also has drift soils and many lakes.

420. History and Government.—For centuries there were many German states, each more or less independent. Some were kingdoms, and others were known as *grand duchies*, *duchies*, *principalities*, and *free cities*. Until 1806 they were loosely banded together in an empire, which at times was too weak to prevent wars among the different states. At length, in 1871, a new German Empire was founded, under a constitution which made the central government strong and powerful. By war with France, it annexed the provinces of Alsace and Lorraine, west of the Rhine.

In the World War Germany again attempted to add to its territory, but was

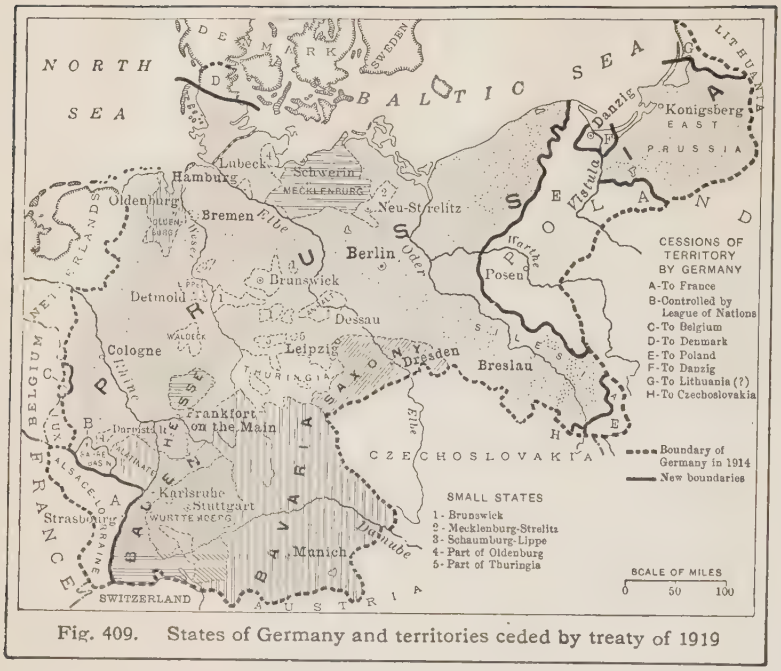

Fig. 409. States of Germany and territories ceded by treaty of 1919

defeated and lost the territories shown in Fig. 409, including Alsace-Lorraine, which was returned to France. To Poland Germany lost still larger areas, including a large region around the city of Posen, extending northward to the Baltic Sea. The part of Prussia around Konigsberg, though still a part of Germany, is thus cut off from the rest of the country. After a plebiscite, or vote of the people, the eastern part of a mining region on the upper Oder River (Fig. 409) was also given to Poland. A part of Schleswig was by vote of its people added to Denmark. A small area on the western border was ceded to Belgium, and the coal beds of the Sarre Basin were turned over to France. Moreover, as security for the carrying out of the treaty, it was agreed that French and other Allied troops should occupy the land west of the Rhine, with small areas east of it.

In 1918 the imperial government of Germany was overthrown and the country adopted a republican form of government, with a president, a Reichstag or legislative assembly, and equal suffrage for all classes and for both sexes. The country is made up of eighteen states, large and small, each with a republican government.

421. The German People.—After the war of 1870 and the formation of the empire, the population increased rapidly until the opening of the recent war. At present the population is greater than that of any other country in Europe except Russia.

Under the empire the people were trained to industry and strict obedience to law. The royal families, the nobility, and the rich expected service from those who belonged to the laboring classes, who tilled the fields, worked in the factories, and carried on the small trades. Class feeling was strong and it was rarely possible for a poor or obscure boy or girl to rise to wealth or to important public positions.

The German people did, however, give much care to education. The schools of all grades are taught by well trained teachers. There are more than twenty universities, of which those of Berlin, Leipzig, Munich, and Heidelberg are among the best known.

422. Agriculture.—Rye and barley are the principal grains, for they thrive best in a cool climate, and the poorer people eat a great deal of rye bread. Much wheat is raised and a large amount of wheat flour is manufactured, but not enough to supply the needs of the people; therefore wheat and flour are also imported. Germany surpasses all other countries in the quantity of potatoes raised, and also in the amount of beet sugar made. Much of the sugar is not needed at home, and is sold in other countries. Many of the farms in Germany are small, and the farmers live in villages and go out each day to their work.

Fig. 410. Castle, town, and vineyards on the Rhine

In the Rhine country there are extensive vineyards, the grapes from which are used in making wine. This part of Germany joins France and the Swiss lowland, which are also regions of grape raising. Along the Rhine and the Moselle the people have, with great labor, terraced many of the steeper slopes, so that the soil is held in place and more vines can be grown (Fig. 410). The vineyards of Germany extend farther north than those of any other country of Europe.

Much attention is given to the raising of live stock. Hogs are fed on the ground pulp of sugar beets from which the juice has been extracted, and on nuts from the forest.

423. Forests and Mines.—For many years Germany has given attention to forest development. About one fourth of the surface is covered by forests, which belong partly to the German states and partly to private owners. The private owner, however, cannot cut trees as he may wish, for he is required by law to preserve the woods. This he does by cutting only mature or ripe trees and by replacing them with young ones. A German forest looks like a densely wooded park (Fig. 411). The majority of the trees are evergreen, including many pines. The beech is also common. The woods are cared for by men trained in the profession of forestry.

Fig. 411. German fir forest

Germany has many mines and quarries. There are beds of coal and of iron ore in several German states. There are also mines of silver, lead, and zinc, and wonderful deposits of common salt and of potash salts. In the southern part of Germany, near the Danube, are quarries of lithographic stone. This rock is a limestone of very fine grain, which is cut into smooth slabs and sent to various parts of the world for making plates used in the production of maps and posters.

424. Manufactures.—Germany is a great manufacturing nation and factories are common in all parts of the country. The greatest concentration of industries, however, is found in the basin of the Rhine below Cologne. Here are vast deposits of coal along the Ruhr, a small river

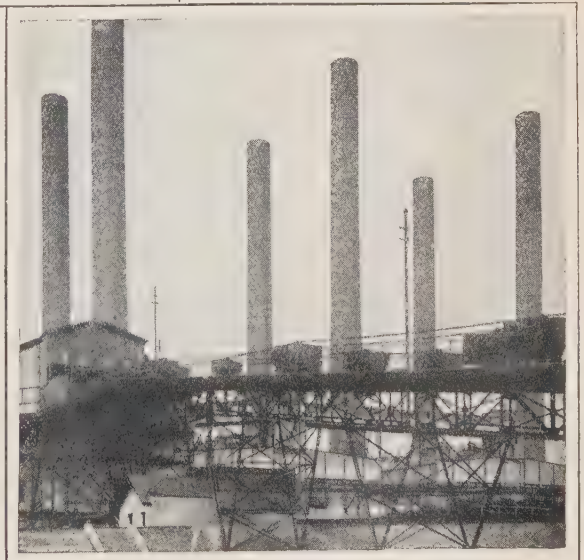

Fig. 412. Power plant near Berlin. Here an abundance of cheap coal is converted into electrical current

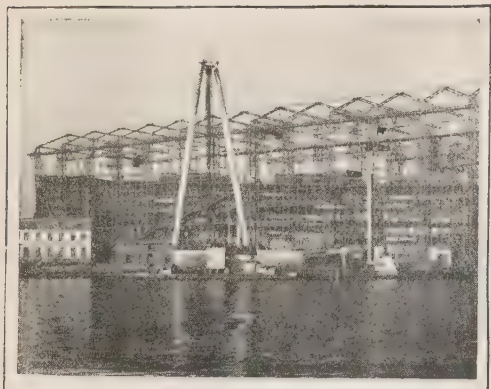

Fig. 413. Shipbuilding at Stettin

Fig. 414. The Reichstag Building, Berlin

flowing into the Rhine from the east. Essen is a center for iron and steel. Some of the iron ore lies close at hand and the rest is brought by ship from Spain and Sweden. It is in this part of Germany that most of the textiles are manufactured, including cotton, woolen, and silk goods.

Outside of the lower Rhine district, Saxony has the most extensive manufactures, including large centers for iron, textile, and printing industries. Industries are also highly developed in and about Berlin. Among German specialties of manufacture are instruments of precision, and drugs, dyes, and a great variety of other chemical products.

In the woodland parts of the country, wood carving is carried on by thousands of peasants and others in their homes, at times when work cannot be done in the fields and vineyards. Toys, clock cases, and carved furniture of all kinds are made.

In many German cities the workmen have acquired skill in making watches, jewelry, and all kinds of gold and silver ornaments and utensils. This work is done especially in Berlin, Nuremberg, Munich, and Augsburg. Fine china is made, the Dresden china being well known. The brewing of beer, a common beverage in Germany, is a large industry.

425. **Commerce.**—Germany has many states, and its domestic commerce is large. Railways have been laid out, rivers improved, and canals constructed, so that the cities and people of the interior may trade with one another and may readily reach the seaports. Most of the railroad lines are owned and operated by the German states. The larger rivers improved for navigation have been joined to one another by canals (Sec. 384).

The population of Germany is so large that much foodstuff must be imported. Because there are many factories, raw materials, as cotton, wool, silk fiber, iron ore, and crude rubber, must also be brought in. Before the World War the foreign trade and the shipping of Germany were large. The terms of peace adopted in 1919 compelled the country to surrender most of its merchant ships in compensation for ships which were destroyed in sea warfare. Its carrying trade was therefore for several years much reduced.

The greater part of the oversea trade enters Germany by way of the North Sea; therefore Bremen and Hamburg (Fig. 408) are more important than the ports on the Baltic. These two ports, as well as Stettin and Kiel, are shipbuilding centers (Fig. 413).

426. **Chief States and Cities of Germany.**—Prussia, somewhat smaller than California, is by far the largest of the German states (Fig. 409). Its capital, Berlin, is also the capital of the country (Fig. 414).

Berlin is one of the three cities of the

world that have more than 3,500,000 people. It is in the midst of the north German plain and lies between the Elbe and Oder rivers. Smaller rivers and canals join it to these rivers and afford navigation for its commerce. Railroads have been built across the lowland and reach out in every direction to the different parts of the country and to all parts of the continent. The manufactures of Berlin are extensive and include the making of machinery, steam engines, and a great variety of woolen goods. The city is also a banking center and has the largest of the German universities and various museums of art and industry.

Breslau is a large city in southeastern Prussia, on the river Oder. It is near coal fields and has important manufactures.

The most western part of Prussia is the country along the Rhine. It is not only noted for the beauty of its scenery and for its ancient castles, but is also known for its manufactures and commerce. Here on the Rhine are Cologne, with its cathedral and its manufactures of Cologne water, sugar, chocolate, and tobacco; and Dusseldorf, a handsome residential city and a center of iron and textile manufacturing. Not far from the Rhine are Essen, the iron-manufacturing center (Sec. 424), and the great textile cities Barmen and Elberfeld. These two cities are so closely connected that they really form one center of population and industry. Frankfort on the Main is a financial and trading center and takes its name from a branch of the Rhine on which it stands.

Saxony is a state south of Prussia, on each side of the Elbe. Its capital is Dresden, where a variety of artistic objects are manufactured, including china, and where there are large art galleries, libraries, and scientific collections; Dresden is a resort for students of music and painting. Leipzig also is in Saxony, and is the most important center in Germany for the printing of books. Chemnitz is another large city of Saxony; its chief industries are in iron work and textiles.

Fig. 415. The heart of Munich

The second largest German state is Bavaria, in the south. It is crossed by the Danube and has the Alps on its southern border. Its chief city is the capital, Munich (Fig. 415), which has important collections of pictures and manufactures a variety of artistic objects, including bronzes and stained glass. This city is one of the chief brewing centers of the country. Another great Bavarian city is Nuremberg (Sec. 424).

Hamburg is the second city of Germany, with a population of about one million. Other important cities are Hanover, Stuttgart, and Magdeburg.

Review.—1. Briefly describe the surface of Germany. 2. Compare the climate with that of Great Britain. 3. When was the former German Empire established? 4. Describe the form of government recently adopted. 5. What recent changes have been made in the boundaries of Germany?

6. Name four of the leading products of the soil. 7. Give an account of the care taken of the forests. 8. What useful kind of stone is exported? 9. In what parts of Germany are important concentrations of industry found? 10. What industry is common in the forest regions?

11. Name the largest German state. 12. Give the main facts about Berlin. 13. Name and locate two German cities that have important picture galleries. 14. Locate two important cities on the Rhine, and two leading seaports.

OTHER COUNTRIES ON THE NORTH AND BALTIC SEAS

	Area, Sq. Mi.	Population	Capital
Belgium	11,760	7,684,000	Brussels
Netherlands	12,772	6,841,000	The Hague
Denmark	16,585	3,289,000	Copenhagen
Norway	124,710	2,646,000	Oslo
Sweden	172,928	5,904,000	Stockholm
Poland	149,000	27,442,000	Warsaw
Lithuania	25,000	2,300,000	Kovno
Latvia	24,000	1,503,000	Riga
Esthonia	18,500	1,110,000	Reval

Map Study (Fig. 407).—1. Give the boundaries and locate the capital of the Netherlands; of Belgium; of Denmark. 2. In what country is Amsterdam? Antwerp? 3. What river crosses Belgium and the Netherlands? 4. Give the latitude of the North Cape (Fig. 371). 5. What countries occupy the Scandinavian Peninsula? 6. Name and locate the capital of each. 7. What countries are east of the Baltic Sea? 8. Locate Warsaw; Riga.

BELGIUM

427. Size and Population.—Belgium is not very much larger than New Hampshire or Vermont, and yet it has a greater population than all New England, important manufactures, and a very great foreign commerce. There are more than 600 people for each square mile in the kingdom. No other country in Europe is so densely populated.

There are two main languages in Belgium. The people in northern Belgium, next to the Netherlands, use the Flemish language, which is much like the speech of their Dutch neighbors. In southern Belgium the people speak French, as their neighbors do over the border in France. The Belgian money unit is the franc, as in France.

Fig. 416. Milk peddler, Belgium

Fig. 417. Lace making, Belgium

428. Industries.—Northern Belgium has a low, flat surface; some of it has been made habitable by building embankments to shut out the sea. The natural streams on this lowland, as well as the many canals that have been dug, make it easy to travel and to transport goods by water. Southern and eastern Belgium are hilly, with forests and many mines, and in this respect southern Belgium is like that part of France which borders it. Valuable deposits of coal, iron, zinc, and lead are found there, and southern Belgium is one of the busiest manufacturing regions in the world. All kinds of glassware and iron and steel goods, as well as cotton, woolen, and linen goods, are made there (Fig. 417).

The people have long been skillful workers in wool; centuries ago Flemish weavers, because of their great skill, were taken to England to improve the woolen industry there. In the early development of the textile manufactures Belgium raised most

of the necessary wool and flax; no cotton goods were made at that time. Now much of the wool and all of the cotton are imported.

The flat lowlands are used mainly for agriculture. The principal crops are hemp, flax, hops, sugar beets, chicory, and a variety of garden vegetables. The farms are small, are worked with great care, and are more like large gardens than like the farms we know. Much food has to be imported, but the manufactures furnish money to pay for it. The foreign trade of Belgium is larger than that of any other small country except the Netherlands.

Fig. 418. City Hall, Brussels

429. Cities and Commerce.—Brussels is the capital (Fig. 418), and has many manufactures, among which those of lace and carpets are important. Antwerp, on the river Scheldt, is the chief seaport of Belgium. It is one of the greatest seaports of Europe, and its ships go to America and all other parts of the world. Belgium has, through Antwerp, a large transit trade; that is, it receives many foreign goods and sends them on to other countries of Europe. Liege is the important city of the hilly interior, and the chief manufacturing center of Belgium. It is in a region of large coal fields, and manufactures woolen goods and steel goods, including firearms.

Fig. 419. A dike in Holland, used as a roadway

Belgium controls nearly all of the great Congo River basin in Africa, and trades in its rubber and other products.

THE NETHERLANDS

430. Surface.—The Netherlands is often called *Holland*, the name of one of its provinces. The whole country is a little larger than Belgium, and about one fourth the size of the state of New York. The land is a low plain, like northern Belgium, which adjoins it. Several rivers cross the country, of which the Rhine is the largest. Much of the southern part of the Netherlands belongs to the delta of this great river. A large bay, the Zuider Zee, deeply indents the northern half of the country.

The name *Netherlands* means that the land is low. Indeed much of it lies lower than the surface of the sea. Several centuries ago the inhabitants, the Dutch people, began to build embankments around the coast swamps. These embankments are called *dikes*, and there are now many hundred miles of them. In places they are as much as thirty feet high. The lowland within is kept free from water by pumping, and is occupied by farms and towns. For centuries the pumping has been done by means of the large windmills often seen in pic-

Fig. 420. Windmills in Holland

tures of this country (Fig. 420). Now some of the pumping is done by means of steam. The people are very industrious and determined, and long ago when their liberties were threatened by the armies of Spain, they sometimes opened the dikes and flooded the lands, in order to defeat the enemy. Many canals are needed to drain the lands and to carry away the water, and these form a network over the country and are used by boats. In some cities, as in Amsterdam, there are canals in many of the streets.

431. **Industries.**—Clay is abundant, and bricks, tiles, and pottery are made in large quantities. There is not much coal or iron in the country, and hence the people are engaged more in farming than in manufacturing. They raise live stock and cultivate many vegetables, fruits, and flowers for home and foreign markets. One of their exports is flower bulbs, of which many are sent to the United States. Many of the tulips, hyacinths, and other flowers seen in American lawns and gardens are grown from Dutch bulbs (Fig. 421). Other important exports are poultry, eggs, butter, and cheese (Fig. 422).

432. **Commerce and Cities.**—The Dutch have always been stubborn fighters, good traders, and excellent sailors. Like the early English and Spanish navigators, they helped to find new lands. The Dutch still have rich possessions in the East Indies and some small islands in the West Indies. Java and other islands in the East Indies furnish coffee, spices, and other products, which Dutch merchants carry to Europe and sell in many markets. The Dutch have a greater foreign trade than any other nation except the United States, Great Britain, Germany, and France.

The capital is a city known as the Hague. It has a splendid art gallery. Rotterdam is one of the world's greatest seaports. Its harbor is used not only by many seagoing ships, but also by river steamers that connect it with Dusseldorf, Cologne, and other cities on the Rhine.

Fig. 421. A field of tulips at Haarlem, Holland

Fig. 422. Cheese market

Amsterdam, near the south end of Zuider Zee, is the largest city of the Netherlands. It is built on a number of islands connected by bridges. A canal joins the Zuider Zee and the port of Amsterdam with the North Sea. Thousands of diamond cutters carry on their industry in Amsterdam, and thousands more do the same in Antwerp. The jewels cut in these two great cities of the Netherlands and Belgium find their largest market in the United States.

Fig. 423. Copenhagen, the great port of Denmark

Review.—1. What is the density of population in Belgium? 2. What languages are used there? 3. Name the capital and two other cities of Belgium. 4. Give an account of Antwerp. 5. What are the main industries of Belgium?

6. What part of the Netherlands belongs to the delta of the Rhine? 7. Describe the means by which the Dutch people have reclaimed much of their country from the sea. 8. In what ways has the position or the character of the country affected the occupations of the people? 9. What interesting export of the Netherlands comes to our country? 10. Give an account of the diamond-cutting industry. 11. Where are the colonial possessions of the Dutch people?

DENMARK

433. Land and Industries.—Denmark consists of the larger part of the peninsula of Jutland, and of several large islands in the Baltic Sea. On one of these islands is Copenhagen, the capital, one of the large cities of Europe (Fig. 423). All the shipping that enters or leaves the Baltic Sea must pass Copenhagen, unless it goes by the Kiel Canal.

Fig. 424. Danish women carrying pails of milk

The land is low and flat or gently rolling. The soil is not of the best, and the climate is too cool for any but hardy crops. Oats, barley, and rye are the chief cereals, but the main industries are dairying (Fig. 424) and the raising of swine and poultry. There are so many cows that some cattle food is imported, including much cottonseed meal from the United States. The chief export is butter, which is sent to Great Britain. The skimmed milk is fed to poultry and hogs. Pork and eggs are produced in large quantities for export.

There are no minerals of value, except clay. Fuel must be imported, and manufactures cannot be large. There are many peat bogs, as in Ireland, and some fuel is taken from them.

434. Iceland.—The king of Denmark is also the king of Iceland, in the north Atlantic. Iceland is a cold country, especially on the north. Sheep, cattle, and horses are raised, some fish are caught, and the eider duck furnishes eider down for export. In Iceland there are volcanoes and geysers.

Greenland and the Faroe Islands belong to Denmark.

Fig. 425. Haying in Norway. Because of the moist climate, the grass is placed on trellises to dry

NORWAY

435. Surface.—The Scandinavian Peninsula is bordered by the Atlantic and Arctic oceans, and by the Baltic Sea and the Gulf of Bothnia. It includes two separate kingdoms, Norway and Sweden. Most of Norway, except in the south, is so mountainous that there is little cultivated land, although there is much pasture. Inlets of the sea, called *fiords*, penetrate deeply into the mountains, and for hundreds of miles the coast is bordered by islands. Ships can go along the coast and far into the interior, in quiet, safe waters.

436. Industries.—There are fewer people in Norway than in Denmark. They get their food and other necessaries of life in several ways. They raise many potatoes and other vegetables and a little grain. They keep cattle and produce much milk, butter, and cheese. The grass in the meadows is fine and short, and when it is cut, it is laid on frames or trellises to cure, because in the moist air it would spoil on the ground if the farmers tried to dry it as is done in our country (Fig. 425). In the summer, members of the farmer's household drive the cattle up into the mountains and live there, watching the cattle and making the butter and cheese. Sometimes they draw up supplies and send down the produce on a long tight wire that reaches from the valley home up to the mountain dairy house.

Lumbering, the manufacture of pulp and paper, condensing milk, and smelting are important industries. Some of the waterfalls are used to develop electricity, and the electrical energy is carried long distances to the mills.

Thousands of Norwegians find work during part or all of the year in the fishing fleets. Like their Viking forefathers, they are good sailors, and Norwegian ships are seen in all parts of the world, carrying the goods of many countries.

437. People and Cities.—Norwegians live among mountains like the Swiss people, but they are also accustomed to the sea, like the Dutch. The hardships of their life are such as to make them a very vigorous people. Many good citizens of the United States, especially west of the Great Lakes, have come from Norway and settled on the fertile prairies. Norwegians speak the same language as the people of Denmark.

Oslo, formerly named Christiania, is the capital and the largest city and the chief industrial center. It has nearly one tenth of the total population of Norway. Bergen is the second city and the chief fish market.

SWEDEN

438. Industries.—Sweden is less mountainous than Norway, and has a greater area of fertile soil suitable for grain, hay, and pasture. Dairying is an important industry, and butter is exported to England. More than half of the country is covered with forest. Much wood pulp and paper are made, besides many other wood products. Hundreds of sawmills, planing mills, and furniture factories are kept busy; and the exports of timber and of articles made of wood are far larger than any others. The forests are protected by limiting the amount of timber that may be cut each year.

Fig. 426. A waterfall in Sweden

Sweden has deposits of iron ore that are among the largest and best in Europe, and there are many iron furnaces. Some of the iron ore is sent to other countries, especially to England. The Sheffield factories buy much of it for making steel tools. As in Norway, electrical energy is developed at waterfalls (Fig. 426), and this power is used in the wood-working and iron-working industries.

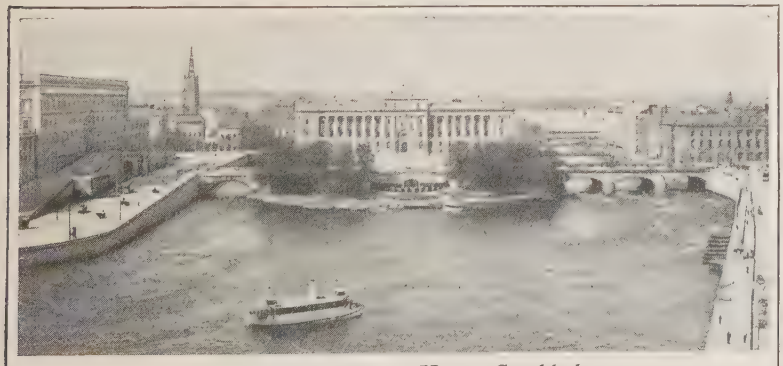

Fig. 427. Parliament House, Stockholm

The Swedes do not sail so many ships as the Norwegians; but they have more agricultural land, more timber, and more minerals with which to make their living.

Stockholm is the capital and largest city of Sweden (Fig. 427). It is an important port, although closed by ice in winter. Goteborg, in the southwest, close to Denmark, has an open port and a large trade. Swedes, like Norwegians, have come to our country and are prosperous citizens of many of our states.

439. Climate of Sweden and Norway.—In both the Scandinavian countries the summer season is short, but the summer days are long. In southern Sweden the midsummer night is only about six hours long. At Trondhjem, the old capital of Norway, a July night lasts about four hours. At the North Cape, for several weeks in the summer, the sun does not set at all, and this is "the land of the midnight sun."

Although the growing season is short, and wet or cloudy days are frequent, the crops have the benefit of some long sunny days. It is for this reason that grain and vegetables can grow rapidly and ripen quickly so far north.

Review.—1. Where is Copenhagen? Why is its position important? 2. What is the main agricultural interest of Denmark? 3. Give an account of Iceland.

4. Describe the shore line of Norway. 5. How are the farming and dairy industries carried on during the summer? 6. What are the other large industries? 7. What facts make Bergen an important city?

8. In what respect is Sweden inferior to Norway? 9. In what industries does it surpass Norway? 10. What is the length of midsummer nights in various parts of the Scandinavian Peninsula? 11. State the location and importance of Stockholm; of Goteborg.

POLAND AND THE BALTIC STATES

440. Poland.—Poland became a separate kingdom nearly one thousand years ago. During long periods it embraced large areas in central and eastern Europe. In general the Carpathian range formed the southern boundary and the Baltic shore was the northern limit. More than one hundred years ago the country was divided among the sovereigns of Prussia, Russia, and Austria. Notwithstanding prolonged persecution the Poles kept their language, their national feeling, and their desire for independence.

Following the World War the Polish people gained their freedom and reunited under a republican form of government. The western boundary of Poland was located partly by the treaty of 1919 and partly as the result of a plebiscite (1921) in the rich coal-mining region of upper Silesia (Fig. 409). The eastern boundary was agreed upon after a hard-fought war between Russia and Poland in 1920.

The Vistula is the great river of Poland and most of the country lies in its basin. On its upper waters and not far from the Carpathian Mountains is Krakow, the ancient capital (Fig. 428). Near the middle of the country on the banks of the river is Warsaw, the present capital (Fig. 429). The city has about 900,000 people and is the chief railway center. Railway lines connect Warsaw with Krakow and Vienna, Berlin, Danzig and the Baltic Sea, Leningrad, Moscow, and Odessa. Posen is an important city in the region recovered from Germany.

Fig. 429. Market in the Jewish quarter of Warsaw

The country is low and flat, except for the foothills of the Carpathians and the glacial hills in the north. In this northern or glacial region there are many lakes and large swamps. A large part of this area is covered with forests.

The leading occupation is agriculture, and the principal crops are rye, oats, wheat, potatoes, and sugar beets. Fine horses, cattle, and sheep are raised. The manufactures include cotton and other textiles, leather, iron, and steel. These industries center

Fig. 428. Bread market in Krakow

Fig. 430. A group of Polish peasant women

Fig. 431. Polish farm house, with roof of thatch

mainly in Warsaw and Lodz. The latter city is especially known for its cotton mills.

Among the mineral resources are coal, iron, zinc, and salt. Not far from Krakow are some of the most remarkable salt mines in the world. The beds of salt are of great thickness and extend for several hundred miles. Like other beds of rock salt they are due to evaporation of sea water in ancient periods of time. Near Krakow is a mine with 48 miles of galleries at different levels down to 900 feet. It has been worked for hundreds of years and is like an underground town. The province of Galicia also has a large output of petroleum.

441. Danzig.—Danzig was for centuries a Polish city but in the dissolution of Poland it came under the rule of Prussia, and it is now peopled mainly by Germans. It is the great seaport at the mouth of the Vistula, and is the chief outlet available for the foreign trade of Poland. At the close of the World War it was internationalized and was made a free city under the care of the League of Nations. Definite privileges in the use of docks and railways are given for the promotion of Polish commerce.

442. Small Baltic States.—Three small countries on the eastern shore of the Baltic Sea have declared their independence of Russian control and have set up republican governments. They are Esthonia, which lies south of the Gulf of Finland; Latvia, on the Gulf of Riga; and Lithuania, which is south of Latvia. Each of these countries is larger than Denmark, but has a smaller population. The Letts and Lithuanians belong to the white race and use kindred forms of speech. The Esthonian language is of Mongolian origin.

Latvia includes the important commercial city of Riga, at the mouth of the Duna, a navigable river flowing out of Russia. The lands of all these countries were covered by the ice sheet of northern Europe, and contain many lakes and swamps and much forest. Lumbering, fishing (Fig. 432), and agriculture are the principal industries.

Review.—1. Outline the history of Poland. 2. Name and locate three important cities on the Vistula River. 3. What is the leading industry of Lodz? 4. What are the chief mineral deposits found in Poland? 5. Give an account of the salt mines. 6. Where is Danzig? 7. Why was this city internationalized at the close of the World War? 8. Name and locate the small Baltic states. 9. What important city is in Latvia? 10. What are important surface features of these countries?

Fig. 432. Fishing boats and sailing vessels at Libau, a Baltic port

Fig. 433
Physical and Political
FRANCE
SPAIN AND PORTUGAL
Scale of Statute Miles
0 50 100 150 200
149 MILES TO ONE INCH
Capitals of Countries: ⊙
Principal Railroads:
ELEVATIONS IN FEET
OVER 5000
2000 TO 5000
1000 TO 2000
500 TO 1000
SEA LEVEL TO 500
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ATLANTIC OCEAN
English Channel
North Sea
Bay of Biscay
MEDITERRANEAN SEA
FRANCE
SPAIN
PORTUGAL
Iberian Peninsula
Spanish Plateau
London
Paris
Rotterdam
Queenstown
IRELAND
WALES
ENGLAND
Cardiff
Southampton
Plymouth
Lands End
Dover
Ostend
Ghent
Dunkerque
Calais
Boulogne
Tourcoing
Roubaix
Lille
BELGIUM
Antwerp
Brussels
Liege
Aachen
Krefeld
Essen
Dusseldorf
Cologne
NETHERLANDS
Amiens
Dieppe
Havre
Rouen
Cherbourg
CHANNEL IS. (British)
Caen
Seine R.
Versailles
Sevres
St. Denis
Reims
Verdun
Metz
Nancy
LUXEMBURG
SAARE BASIN
Pte. St. Mathieu
Brest
St. Malo
Britanny
Rennes
Le Mans
Lorient
Orleans
Troyes
Colmar
Mulhouse
Belfort
Basel
Besancon
Dijon
Angers
Tours
St. Nazaire
Loire R.
Nantes
Cher R.
Le Creuzot
Bern
SWITZERLAND
Geneva
Lyon
Macon
Rhone R.
Saone R.
Rochefort
Clermont Ferrand
Limoges
Mt. Dore
Auvergne Mts.
Cevennes Mts.
St. Etienne
Grenoble
Mt. Cenis 6,366
MT. CENIS TUNNEL
Mt. Blanc 15,781
Gironde R.
Cognac
Bordeaux
Dordogne R.
Garonne R.
Avignon
Nimes
Montpellier
Monaco
Nice
The Riviera
Bayonne
Toulouse
Lourdes
Marseille
Toulon
Gulf of the Lion
Perpignan
C. Ortegal
Ferrol
Coruna
Finisterre
Gijon
Oviedo
Santander
San Sebastian
Bilbao
Cantabrian Mts.
Pyrenees Mts.
ANDORRA
Vitoria
Pamplona
Ebro R.
Burgos
Valladolid
Pisuerga R.
Esla R.
Minho R.
Braga
Oporto
Douro R.
Salamanca
Sa. de Gata
Sa. de Guadarrama
Coimbra
Sa. de Gredos
Zaragossa
Barcelona
Tarragona
Tortosa
Madrid
Covilha
Tagus R.
Toledo
Castellon
Valencia
Gulf of Valencia
BALEARIC ISLES (Spain)
MINORCA
MAJORCA
CABRERA
IVIZA
FORMENTERA
Lisbon
Setubal
Elvas
Evora
Badajoz
Almaden
Alcoy
Alicante
Guadiana R.
Sierra Morena
Linares
Segura R.
Murcia
Cordoba
Jaen
Lorca
Cartagena
Huelva
Seville
Granada
C. St. Vincent
Faro
Palos
Gulf of Cadiz
Jerez
Cadiz
Sierra Nevada
Almeria
Malaga
Algiers
Strait of Gibraltar
Gibraltar (British)
Tangier (Neutral Zone)
Ceuta
Tetuan
Oran
Melilla
To Spain
MOROCCO
ALGERIA
CORSICA
Same scale as main map
C. Corse
Bastia
CORSICA (French)
Ajaccio
Str. of Bonifacio
SARDINIA (Italian)
5° Longitude West from Greenwich 0° Longitude East from Greenwich 5°
THE MATTHEWS-NORTHRUP WORKS, BUFFALO, N. Y.

Fig. 434. Vineyard in southern France, near Bordeaux. The grapes are used in making wine

FRANCE

AREA, 212,822 sq. mi. POP., 39,210,000. CAPITAL, Paris.

Map Study.—1. What barrier separates France from Spain? From Italy? 2. What countries border France on the east? 3. What waters are on the north, west, and south?

4. Describe the four chief rivers, in respect to their positions and their courses. 5. Locate Havre, Bordeaux, and Marseille. 6. Locate Paris, Lyon, and Lille. 7. With the scale of miles determine the distance between Havre and Marseille. 8. What port of France is opposite Dover in England? 9. Name the westernmost port of France.

PHYSICAL GEOGRAPHY

443. Climate and Rivers.—France is much smaller than the state of Texas. It has little waste land, however, and supports about 40,000,000 people. It is farther south than Great Britain and therefore has a warmer climate, especially in the part that borders the Mediterranean Sea. Paris is in latitude 49° north, the same latitude as the boundary between western Canada and the United States.

The central and western parts of France slope toward the Atlantic Ocean and the English Channel, and are drained by three large rivers. To the north is the Seine, on which Paris is situated, with Havre at its mouth. Next southward is the Loire, on which are Orleans and Tours, with the ports of Nantes and St. Nazaire near its mouth. In southern France is the Garonne, with Toulouse on its course and Bordeaux near its mouth. Eastern France drains to the south by the Rhone and eastward to the Rhine. On the Rhone, where the Saone flows into it, is Lyon, and near the mouth is Marseille, the second city of France, and its largest seaport. The Rhone has a large delta, whose flat, swampy land is not suitable for a city, and the large Mediterranean seaport of France is located on higher ground to the east.

444. Highlands.—The main highland is in the interior of France, around St. Etienne, and extends to the north, south, and west.

It consists of low, well-worn mountains and hills. France has several uplands on its borders. To the south the high Pyrenees separate it from Spain. They are so high and unbroken that the railways between France and Spain pass around the ends of the range. On the southeast the Alps separate France from Italy. Mont Blanc, the highest peak in Europe, with an altitude of 15,781 feet, is in France (Fig. 435). Between France and Switzerland are the low Jura Mountains, while the Ardennes highlands are on the Belgian border. The Vosges Mountains are in eastern France near the Rhine.

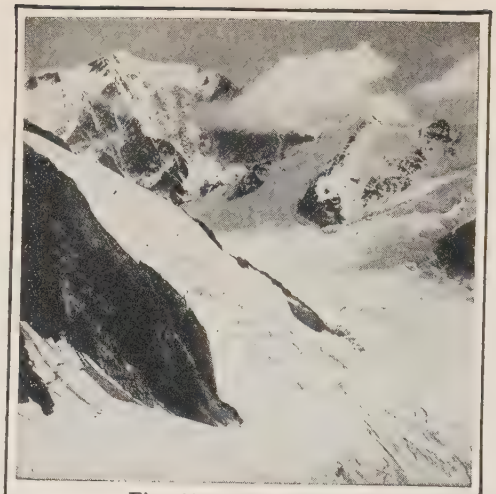

Fig. 435. Mont Blanc

PEOPLE AND INDUSTRIES

445. History and People.—In the time of Julius Cæsar, this region was called Gaul, and he made it part of the Roman Empire (Sec. 387). In modern times it has been sometimes a monarchy and sometimes a republic. Under the Emperor Napoleon Bonaparte the country was for a time greatly enlarged. After many other changes, France in 1871 became a republic, as it is to-day. It has a president, a senate, and a chamber of deputies, and thus has a form of government somewhat like ours.

The French language has been derived from the Latin by many centuries of gradual change. It has long been studied and spoken by educated people in many parts of Europe and in other lands.

The French have good schools, and a great national university which includes many colleges scattered over France. The people are industrious, skillful, thrifty, and patriotic, and are great lovers of all beautiful things. Population has not increased rapidly in recent years, and few French emigrants have gone out to settle in other countries.

Fig. 436. Potash mine, Alsace. Most of the potash is used in fertilizers

446. Alsace-Lorraine.—The provinces of Alsace, on the Rhine, and Lorraine, on the Moselle, were taken by Germany in 1870–1871, but were recovered by France in 1918. They are about as large and as populous as Connecticut and Rhode Island. Their restoration to France is of immense importance because of their mineral resources and manufactures. Lorraine has extensive beds of iron ore. Alsace has great textile industries, vast deposits of potash (Fig. 436), and some salt and petroleum. Its chief city is Strasbourg, which carries on a large trade.

447. Forests and Agriculture.—The French people appreciate the value of trees; they take good care of the forests, plant many young trees, and let no wood go to waste. Even small twigs are cut up and tied in bundles, for kindling.

France is a land of small farms, which are usually owned by the farmers, and not, as so commonly in Great Britain, by the nobility. For this reason the farmers take interest in their land and raise good crops. They raise about one third as much wheat as we do in the entire United States, and, unlike the British, provide nearly all their own bread. The average wheat field in France yields about 20 bushels an acre (Fig. 437). There are many flour mills to prepare the grain for use. The people produce much of their own meat supply and an abundance of fruit and vegetables. They economize carefully and make a small supply go a long way towards a comfortable living. In the fields the peasant women often work beside the men. It is common for the farmers to live in village communities and go out to work in the fields.

Many chestnuts and walnuts are raised, and the walnuts are an export to the United States. We buy them under the name "English walnuts." In the warm southern parts of France olive trees flourish, and the fruit is bottled, or is pressed for the oil. One of the most important products is grapes.

The care of vines, the gathering of the grapes, and the making of wine and raisins are branches of the grape industry. In France the vineyards extend up the Rhone and Saone valleys and into the valleys of the Seine, the Moselle, and the Rhine. All of France south of Paris has valleys where vineyards abound, especially along the Garonne and its branches (Figs. 434, 438). So much wine is made in this southwestern part of the country that Bordeaux is the most important city in the world for trade in wine.

448. **Manufactures.**—The French do not manufacture so extensively as do the people of the United States or Great Britain, but they make some things extremely well, especially such artistic things as fine jewelry, dress fabrics, laces, tapestries, gloves, and perfumery. For the operation of their large mills and factories part of the coal must be imported, and in the iron and textile industries France does not take rank with Great Britain, which supplies all its own fuel.

Northern France is the region that includes Paris and extends to the English Channel and the Belgian boundary. It has more factories than any other part of the country. This is because there are coal and iron along the Belgian border as there are in Belgium. There are also iron mines in Lorraine, and France owns the coal mines of the Sarre Basin, north of Lorraine.

Bales of cotton and other raw materials are brought by ship to Havre, and from this port they are taken by rail or by smaller boats up the Seine to Rouen and Paris. Paris manu-

Fig. 437. Harvesting wheat, France

Fig. 438. Young grape pickers

factures clothing and many things that require fine skill and artistic taste. At Rouen and Mulhouse are large cotton mills. It was in Rouen that Joan of Arc, a famous French heroine, met her death. Lille makes textile and iron goods. It gives the name to lisle thread, much used in making gloves and hosiery. Amiens, Reims, and other cities make woolens. These two places and Rouen contain celebrated old cathedrals (Fig. 439).

Lyon and the region near it form the second greatest manufacturing part of France. The silk industry is foremost in Lyon (Sec. 449). Southwest of it is St. Etienne, which is near a coal field and has iron works, but much silk ribbon also is made there. Farther north is Le Creuzot, the chief iron-working city of France. It resembles Pittsburgh in the United States and Birmingham in England, but does not equal either of those cities in the amount of its manufactures. Fine porcelain ware is made at Limoges in south-central France, and at Sevres, a few miles from Paris.

Fig. 440. Factories at Lyon on the Rhone

449. Lyon and the Silk Industry.—Lyon is an ancient city at the junction of the Rhone and Saone rivers (Fig. 440). During more than two thousand years the valley of these rivers has afforded a lowland road from the Mediterranean Sea to northern Europe and Great Britain.

All about Lyon are groves of mulberry trees. The leaves are picked and fed to silkworms. When full grown the worms or caterpillars form from their bodies the silk fiber and wind it around themselves, forming cocoons. These very fine fibers are carefully unwound and made into silk thread and silk fabrics. Lyon makes more silk goods than any other city in the world, though other cities have large silk industries. Among these are St. Etienne in France, the chief center for the manufacture of ribbons, and also Crefeld in Germany, Milan in northern Italy, and Paterson in New Jersey. Only part of the silk fiber used in Lyon comes from France. Much of the raw silk is produced in Italy, or is brought in by way of Marseille from China and Japan.

Fig. 439. Cathedral at Reims, which was much damaged in the World War

450. Paris.—Paris, on the Seine, is the capital of France. It is the fourth city of the world, with a population of about 3,000,000. It is one of the most beautiful cities in the world, because of its fine buildings, splendid avenues, its parks, and its works of art. It lies on both sides of the river, which is crossed by many bridges. Around it is much of the most fertile land in France, and railroads run from it to all parts of France and most of the other countries of continental Europe. Ex-

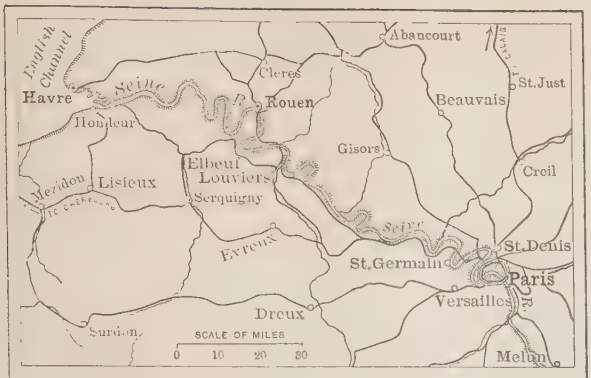

Fig. 441. Paris and its seaport, Havre

press trains go to Rome, Constantinople, Berlin, and Moscow, while a short passage by railway and a channel boat, or a regular airplane service, takes the traveler to London.

The cathedral of Notre Dame in Paris is one of the finest in Europe (Fig. 442), and the Louvre, an art gallery, contains many of the world's greatest treasures in painting and sculpture. Among these is the Mona Lisa, a painting by Leonardo da Vinci, and the Venus de Milo, one of the beautiful Greek statues of an earlier time. Many articles of dress and ornament are made and sold in Paris, which is the world's center for fashionable dress. The exports from Paris to the United States are very large.

451. Waterways and Seaports.—The main rivers have been deepened in places to fit them for navigation, and the larger rivers have been joined to one another by canals (Secs. 383, 384). Freight can thus be taken from Paris northward to Brussels and Antwerp; or eastward to Strasbourg on the Rhine; or southward to Lyon and Marseille. In like manner boats go from Bordeaux up the Garonne River and to Marseille. Starting from the mouth of the Rhone, one could go by boat to Bordeaux; to Nantes by the Loire; to Havre; to Antwerp or to Rotterdam by way of Lyon, Strasbourg, and the Rhine.

Marseille (Fig. 443), Havre, and Bordeaux are the most important seaports. Cherbourg, Boulogne, and Brest are other ports much used in trade with the United States, while Calais and Dieppe are the chief ports of departure for England.

Fig. 442. Cathedral of Notre Dame, Paris

452. The Riviera and Small States on the French Border.—The word Riviera means shore line, but it is especially applied to the coast of southeastern France and northwestern Italy. The region is protected from north winds by high mountains, and it is so warm that palms and oranges grow there, although in the latitude of our northern states. It is a winter resort for Europeans and Americans (Fig. 444).

Fig. 443. Wharf at Marseille

Fig. 444. The Riviera, near the boundary between France and Italy

On this shore is the independent principality of Monaco, containing only eight square miles, and best known because of the resort called Monte Carlo.

At the point where France, Belgium, and Germany come together is the grand duchy of Luxemburg, a hilly region of about 1000 square miles, with a population of about 260,000. It supplies much iron ore to the adjoining manufacturing districts.

The Sarre Basin, between France and Germany, is a little smaller than Luxemburg. It is controlled by the League of Nations, but its rich coal mines belong to France.

The republic of Andorra, in the Pyrenees, is under the protection of France and Spain. It has a territory of 175 square miles, and about 5000 inhabitants.

453. French Foreign Possessions.—The French possessions include parts of Africa, Asia, and South America, and a number of islands (Fig. 350). Algeria and Tunis in north Africa are the most important, and France controls much of the Sahara and Sudan and part of the Congo River region. Other possessions are in Indo-China in southeastern Asia, the island of Madagascar off the east coast of Africa, St. Pierre and Miquelon near Newfoundland, Guadeloupe and Martinique in the West Indies, French Guiana in South America, and many islands in the Pacific Ocean.

Review.—1. Give the size and population of France. 2. Name the highlands on the south and east borders of the country. 3. When did France finally adopt its present form of government?

4. What difference exists between the farms of France and of Great Britain? 5. Give an account of wheat raising in France. 6. Where are the grape districts of the country? 7. Name and locate the chief trading center for wine.

8. Name the chief centers and kinds of manufacture in northern France. 9. Explain why the possession of Alsace-Lorraine is important. 10. Name two cities not far from Lyon, and give their industries. 11. How is silk fiber obtained? 12. What countries produce the most of it? 13. What cities are centers of silk manufacture?

14. Name some interesting buildings in Paris. 15. What are the railway facilities of the city?

16. Describe five routes by which a boat may go by river and canal from the Mediterranean Sea to the Atlantic Ocean, the English Channel, or the North Sea.

17. Where is Andorra? Monaco? The grand duchy of Luxemburg? The Sarre Basin? 18. Name the foreign possessions of France.

SPAIN AND PORTUGAL

	Area, Sq. Mi.	Population	Capital
Spain	192,000	20,784,000	Madrid
Portugal . . .	34,264	5,546,000	Lisbon

Map Study (Fig. 433).—1. Give the land and water boundaries of the Iberian Peninsula. 2. What three rivers have their courses partly in Spain and partly in Portugal? 3. What cities are at the mouths of two of these rivers? 4. What is the chief river of southern Spain? 5. What river of northern Spain flows into the Mediterranean? 6. Name and locate the capitals of the two countries. 7. What group of islands is near Spain on the east? 8. What mountains are in the northern part of Spain? In southern Spain?

454. Physical Geography.—The Iberian Peninsula, including Spain and Portugal, is a little larger than France, and contains about 25,000,000 people. The greater part of the peninsula is a plateau 2000 feet or more above the sea. The lowlands are found in a narrow strip along the coasts and in the valleys of the larger rivers. Above the plateau rise a number of east and west mountain ranges. The highest of these ranges, the Pyrenees and Cantabrian Mountains in the north, and the Sierra Nevada in the south, carry snow on their upper slopes throughout the year. One can stand on the shores of the warm Mediterranean and see the eternal snow fields of the Sierra Nevada.

In the winter the peninsula is in the track of the westerly winds, and the lands near the Atlantic receive rains; but the rainfall in the interior is small. In the summer the northeast trade winds cross the peninsula (Sec. 386), and the rainfall is small. The interior is so far from the sea that its climate is continental, being cold in winter and hot in summer.

The coast line is regular, and there are few good harbors. The rivers do not afford much navigation, both because they flow mainly on the interior uplands, and because the country is too dry to furnish much water.

455. History and People.—At the time of the discovery of America, Spain and Portugal were among the strongest countries in Europe, and they gained great possessions in the New World. They have from time to time lost these, but Spain still holds the Canary Islands and parts of western Africa. Portugal has the Azores Islands and the Madeira Islands (Fig. 350); also large territories in the eastern and western parts of southern Africa, and some small possessions in southern Asia.

Spain is a monarchy, but Portugal in 1910 passed through a revolution and adopted the republican form of government. The Spanish and the Portuguese people have lived from generation to generation without much change of any kind. More than half of the people cannot read or write. There is now some desire to improve, to have better education, better homes, and more liberty. This is shown by the change of government in Portugal, and by the growth of modern industries in some parts of Spain.

The Spanish and Portuguese languages, like the French, are derived from the Latin tongue, and the countries belong with France and Italy among the Latin countries of Europe.

456. Agriculture.—Much of the interior is not suited to crops (Sec. 454), but is used for pasture, especially for sheep, of which many are kept in Spain. It was from the flocks of Spain that the well-known Merino sheep were taken to start flocks in the United States and other countries.

Wheat is the principal grain, and is raised in the north of Spain around Valladolid, and in the basin of the Ebro. All along the coast, from Barcelona to Oporto, orange trees flourish, especially north and south of Valencia, a seaport that exports oranges (Fig. 445). The olive grows in the same belt, and farther north on both coasts. In the interior irrigation is extensively used in raising these fruits. The vine is cultivated also on all the coasts and far up the valleys of the main rivers.

Fig. 445. Sorting oranges for shipment, near Valencia, Spain

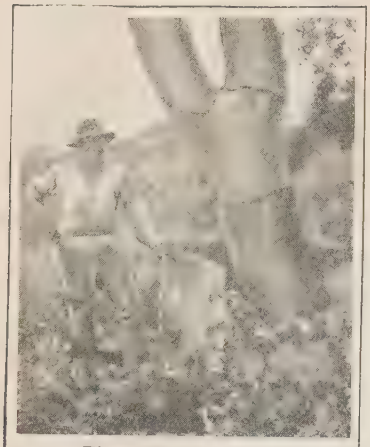

Fig. 446. Cork oak

Like France and Italy, the peninsula produces and exports large quantities of wine. Port wine derives its name from Oporto in Portugal. Another important export is cork (Fig. 446), from the bark of the cork oak, which grows in both countries.

457. Cities and Trade.—Spain and Portugal are backward in manufactures, and their chief exports consist of fruits and fruit products and minerals. The railroads are poorly developed, and the rivers are only in a small degree navigable. Most of the commercial centers, therefore, are near the sea.

The chief seaport, and the second city of Spain, is Barcelona, on the Mediterranean. It is also the principal center of manufacturing in Spain, especially of textiles. Valencia is another important seaport because it is in the center of a large irrigated orange region, and ships thousands of boxes of this fruit to foreign countries. It also exports great quantities of onions, raisins, and almonds, which are raised in that part of Spain.

Iron, copper, and lead ores are found in large quantities in Spain. They are shipped from Cartagena and several smaller seaports on the south shore. The greatest port for iron, however, is Bilbao in northern Spain, on the Bay of Biscay (Fig. 448). Much ore is shipped from this place to Great Britain and Germany. As there is coal also not far away, Bilbao has furnaces for separating the iron from the ore and for making steel. Spain is exceeded only by Italy as a producer of the curious but important metal known as mercury, or quicksilver. It is found around Almaden, south of the center of the country.

Lisbon (Fig. 447) and Oporto are the chief seaports of Portugal. They export wine, cork, olive oil, and fruit.

Fig. 447. Avenue in Lisbon, Portugal

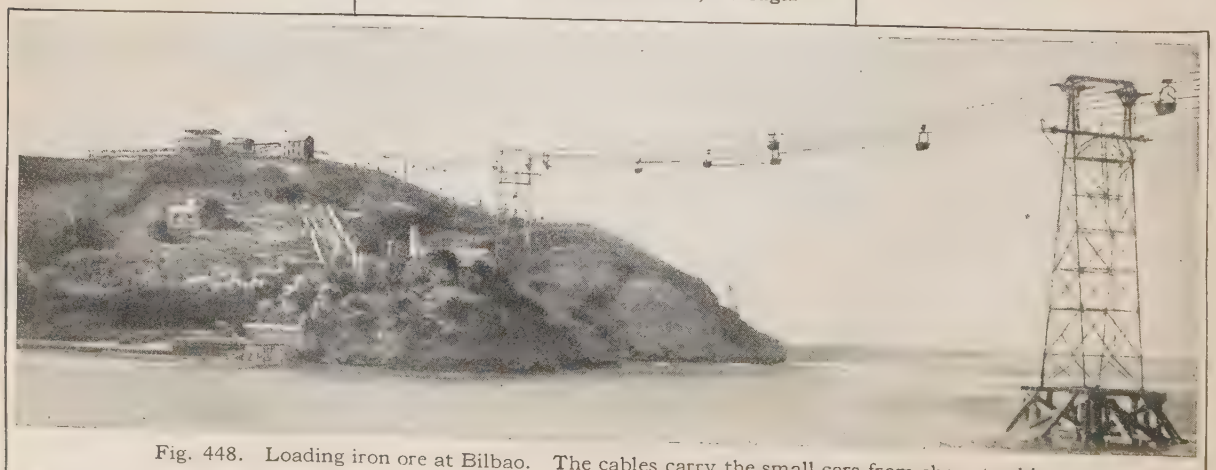

Fig. 448. Loading iron ore at Bilbao. The cables carry the small cars from shore to ship

Madrid is the capital and the largest city of Spain, with a population of more than half a million. It is on the interior plateau, surrounded by a dry and barren region that is cold in winter and hot in summer. It has fine streets, magnificent palaces (Fig. 449), and a splendid gallery of pictures. It is a railway center and has some manufactures of porcelain, glass, and metal ware, and is especially important as the home of the rich and ruling classes.

458. Moors in Spain.—Many hundreds of years ago much of southern Spain was conquered and held for a long time by Moors, a Mohammedan people that came from Africa. Their chief city was Granada, on the north of the Sierra Nevada. Here is the Alhambra, a palace that is a wonderful example of Moorish skill in building. It is described in Washington Irving's book of that name.

Fig. 449. The Royal Palace, Madrid

459. Gibraltar.—Just inside the Strait of Gibraltar on the European side is a peninsula from which rises the great rocky height with steep sides, known as Gibraltar (Fig. 450). The rock, with its sloping base, covers an area of nearly two square miles, and is occupied by a population of about 25,000, many of whom are soldiers. The British people, who own Gibraltar, have made it a great fortress, one of the strongest in the world. Its guns command the entrance to the Mediterranean Sea, and some British warships are always to be found there. Between Gibraltar and Spain is a narrow strip of flat land that is unoccupied and is considered as neutral ground; that is, belonging to neither.

Fig. 450. The Rock of Gibraltar

Review.—1. How do the countries of the Iberian Peninsula compare with France in area and population? 2. Give a general description of the surface. 3. Why does most of the peninsula have little rain? 4. How does the coast line differ from that of Great Britain?

5. What are the foreign possessions of Spain? Of Portugal? 6. When did Portugal adopt its present form of government? 7. What is the condition of the Spanish and Portuguese peoples?

8. What kind of live stock is kept in Spain? 9. What is the principal grain? In what part of Spain is it most raised? 10. Where are oranges produced? Olives? Grapes?

11. Name and locate the chief commercial city of Spain. 12. What kind of manufacture is important there? 13. What seaport is the chief Spanish place for trade in oranges and onions? 14. Locate Bilbao and explain its importance. 15. Where is mercury mined? 16. Give some important facts about Madrid.

17. Name and locate the chief Moorish city of Spain. 18. What is the Alhambra?

Fig 451. Physical and Political
ITALY, RUMANIA
AND OTHER COUNTRIES OF
SOUTHERN EUROPE
Scale of Statute Miles
0 50 100 200
158 MILES TO ONE INCH
Capitals of Countries: ⊙
Principal Railroads:
ELEVATIONS IN FEET
OVER 5000
2000 TO 5000
1000 TO 2000
500 TO 1000
SEA LEVEL TO 500
Longitude East from Greenwich 20°
CRETE
(To Greece)
Same Scale as Main Map
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Fig. 452. A Swiss farmhouse in a valley of the Alps in summer

SWITZERLAND AND ITALY

	Area, Square Miles	Population	Capital
Switzerland	15,956	3,880,000	Bern
Italy	123,000	40,070,000	Rome

Map Study.—1. What countries border Switzerland? 2. What countries border Italy? 3. What large islands are a part of Italy? 4. Trace the course of the two chief rivers of Italy. 5. Locate Mt. Vesuvius and Mt. Etna. 6. Where is the island of Elba?

7. What is the capital of Switzerland? 8. Locate Zurich and Geneva. 9. Locate Milan and Turin, in Italy. 10. Locate Genoa and Venice. 11. Locate Florence, Leghorn, and Naples. 12. Where is the Strait of Messina? Locate Palermo.

SWITZERLAND

460. The Swiss Land.—Switzerland is only about one third as large as the state of New York. Although much of its surface is too high and rocky for farms and homes, the population is on the average about 240 people for every square mile. Here, as in Belgium and in England, many people are able to live in a small country because they are enterprising and produce a variety of manufactures which they sell to buy food and clothing.

Switzerland includes the central parts of the Alps, with hundreds of mountain peaks and hundreds of snow fields and glaciers (Fig. 452). In the lower valleys are vineyards, gardens, and fields of grain. On the lower

slopes of the mountains are the common trees with broad leaves such as beech and maple. Higher up are evergreen forests and grassy pastures, and above these are snow and rocks. Far above the tree limit, wild flowers of many colors bloom in summer on the stony slopes.

On the higher mountains the air is cold and the snows remain year after year. We call the lower limit of snow the *snow line*. On steep slopes the snows sometimes slide down in great masses, destroying trees and houses. Such a slide is an *avalanche*. When the snows pack together in the high valleys and change to ice, the ice may form a slowly moving glacier (Fig. 374).

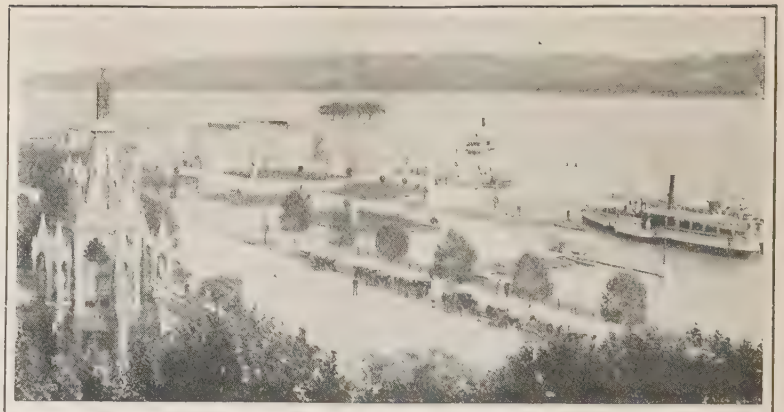

Fig. 453. Lake of Geneva, seen from the city of Geneva

Among the celebrated peaks of the Swiss Alps are the Matterhorn and the Jungfrau.

The northern part of Switzerland is a hilly plateau, 1000 to 2000 feet above the sea. Here are most of the farms and all the cities and largest towns. This region is sometimes called the Swiss lowland, because it is low as compared with the mountains. There are several large lakes. The most important are the Lake of Lucerne, Lake of Geneva (Fig. 453), and Lake of Constance. The Lake of Constance is on the boundary between Switzerland and Germany, and the Lake of Geneva is partly in France.

Switzerland is in the track of the westerly winds, and as it has so many high mountain ranges, much rain and snow fall, the fields are well watered, and the mountain snows are the source of great rivers (Sec. 383). Because the country is inland, it has a continental climate. Even among the snow-capped mountains, the valleys are warm in summer, and the whole country is cold in winter.

461. The Swiss People.—Life in the mountains tends to make people independent, strong, and home loving. Such a country is easier to defend than a flat and open region. For centuries the Swiss have been a brave and independent people. Whether William Tell ever really shot the apple from the head of his son, or not, the story gives a true idea of the people. They could not be easily subdued, and the greater powers of Europe have agreed to guarantee the independence of this little country.

The country is divided into a number of small states called *cantons*. These are united into a republic, at the head of which is a president, who is elected annually. Three principal languages are spoken. In the east and north, bordering Germany, most of the Swiss speak German. In the west, they speak French, and in the south, Italian.

On the farms and in the villages the Swiss build most of their houses of wood, because it is plentiful. Some of the houses are large and have several stories. They often include barn room also, the cattle and other stock, with the hay and grain, being under the same roof with the family. The roofs project far over the sides of the house, or *chalet*, giving it a homelike and graceful appearance (Fig. 452).

462. Swiss Industries.—The farmers raise the common grains and vegetables, and there are many vineyards in the warmer lowlands, and on the steep slopes around the Lake of Geneva. In the mountain valleys the chief industry is dairying. The thrifty farmers

Fig. 454. Swiss farm yard

save every bit of grass that they can gather for hay, and they drive the cattle to the upper pastures in the summer, somewhat as the Norwegians do (Sec. 436). The hay and wood from the higher fields and forests are dragged down the mountain side; and even young boys carry milk on their backs in large casks which are flat on the side that rests against the back.

The Swiss are skillful in making things in their homes. Many of them spend the winter days and evenings carving ornaments and trinkets from wood, which they sell to the next summer's tourists. In the cities the Swiss artisans are very skillful. They make silk, cotton, and other textiles, and also many million dollars' worth of embroidery each year. Much of this embroidery is sold in America. The Swiss also make jewelry and an immense number of watches. Many Americans have seen, or perhaps carry every day, a watch made in Geneva or Neuchatel. The Swiss make many kinds of cheese for home use and for export. Zurich (Fig. 455) is an important trade center and manufactures both silk and cotton goods.

Switzerland has no good coal, but it imports some, and also uses the water of its streams and waterfalls to furnish power. Because the Swiss are so thrifty and skillful, they have a foreign trade that amounts each year to much more than that of Spain, a country with a population nearly five times as large.

463. Travel in Switzerland.—Switzerland has been called the "playground of Europe." British people are fond of going there for their summer "holiday," — a word which they use to mean vacation. Thousands of Germans and Austrians also love to tramp among the mountains, and in the summer American tourists are seen in all the hotels and on all the roads. The Swiss mountaineers spend most of their summers keeping boarders, supplying vegetables, or acting as guides to visitors.

Alpine guides are daring but trustworthy, and with their aid many travelers climb the various summits of the Alps every summer. Sometimes these guides are taken to Asia or South America to help mountain climbers in those lands.

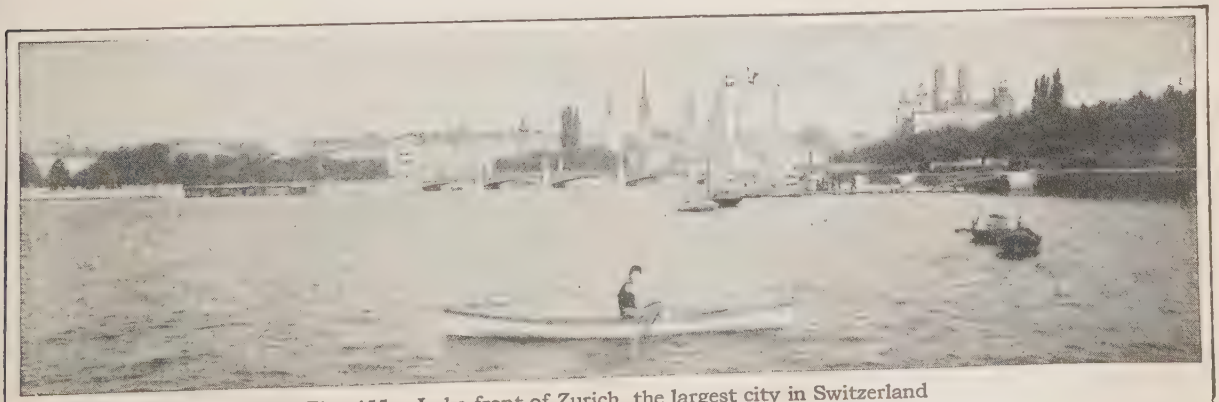

Fig. 455. Lake front of Zurich, the largest city in Switzerland

The roads of Switzerland are well built, and many of them are made by blasting the rock from the mountain side. Motor cars of the Postal Service carry mails and people over the roads. Switzerland has a good railroad system. The Swiss have built mountain railroads by which they carry passengers up steep slopes (Fig. 456), and even to the tops of several of the high peaks. Many people are thus enabled to have splendid views from mountain tops.

Fig. 456. Electric railway up the Jungfrau, an Alpine peak in Switzerland

464. Passes and Tunnels.—High valleys leading from one side of a mountain range to the other are known as *passes*. They are of far greater importance to the student of geography than are the most wonderful mountain peaks. This is true because of the influence of passes upon the location of routes of trade and travel. There are many passes in the Alps, and at the summits of a number of them were formerly built refuges, or hospices (Fig. 457), where devoted monks lived to help travelers in the cold and storms. The St. Bernard monks and their dogs still do this work.

Long tunnels have been made under some of the ranges, so that railroad trains can go through without climbing to the top; also the trains can pass through in winter as well as in summer. The Simplon tunnel is the longest of the great tunnels on railroads that connect Switzerland and Italy. It is about twelve miles long, and a train passes through it in about twenty minutes. In the tunnel trains are moved by electricity, so that the air is kept free from steam and smoke. It required great engineering skill to construct so long a tunnel. The work was carried on from both sides of the mountain range at the same time until the two parts met.

Review.—1. Give the size and population of Switzerland. 2. Define avalanche; the snow line. 3. What is a Swiss state called? What is the Swiss form of government? 4. What are the principal languages of the country? 5. What are the chief manufactures of Switzerland? 6. Define diligence, pass, hospice. 7. Describe the Simplon tunnel.

Fig. 457. Hospice at the Great St. Bernard Pass, on the southwestern border of Switzerland

Fig. 458. Bellagio, a town at the junction of the two southern arms of Lake Como

ITALY

465. Physical Geography.—The most northern parts of Italy are among the southern slopes and peaks of the Alps. Many rivers rise in the glaciers and snow fields, and flow down the slopes and across the plain into the river Po. On their way, some of them pass through beautiful lakes bordered by mountains (Fig. 458). These Italian Lakes are much visited for pleasure and recreation. Several railroads come through long tunnels or across passes and connect Italy with the rest of Europe.

The Po is the chief river of Italy, and it is bordered by fertile plains. It spreads the fine rock waste of the Alps over these plains in time of flood. It has built its delta out into the Adriatic Sea so rapidly that some towns that were on the sea border two thousand years ago are now several miles inland. Smaller tributaries flow into the Po from the Apennines on the south.

In the west, the main Alpine range bends to the south, and joins the Apennines. The Apennines extend the whole length of the peninsula of Italy, and in parts of the peninsula the mountains and hills occupy nearly its entire width. There are small lowlands on some parts of the shore and along the rivers, among which are the Arno and the Tiber. There are also small basins of flat and rich land high among the mountains. The largest river, next to the Po, is the Tiber, on which stands the city of Rome. The ancient Romans called it the " yellow Tiber," because it was muddy and discolored, as it is now, by the land waste brought from the mountains of the interior.

Much of the island of Sicily, which belongs to Italy, is mountainous, but owing to good soil and a warm climate, the small lowlands are very productive. The island of Sardinia, which also belongs to Italy, is very rugged and is unproductive except in minerals.

466. Climate.—Italy is as far north as our northern states, and yet it has a mild climate, and in the south is so warm that many tropical fruits and palms flourish. The basin of the Po is well protected from cold north winds

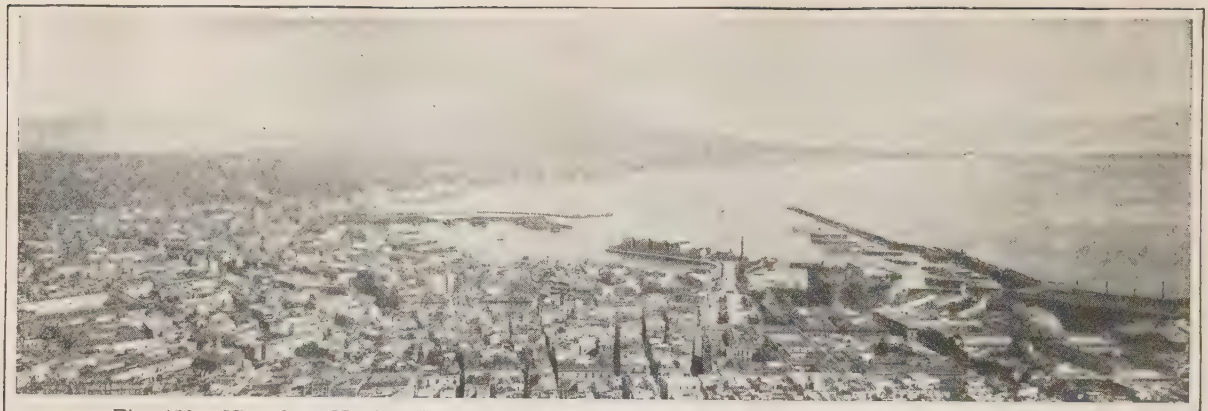

Fig. 459. View from Naples, showing part of the city and the bay, and Mt. Vesuvius in eruption

by the great Alpine mountains. The shores of the peninsula and the islands are washed by the warm Mediterranean waters. Winds from these waters blow inland, and except in the higher mountains there is rarely frost.

Most of the rainfall is in the winter, when it is not helpful to crops. In the summer the peninsula is in the belt of the northeast trade winds and has little rain. Hence irrigation is much used. In the Po basin there is more rain, but the plentiful water of the rivers also is employed to irrigate the fields, because in this way two or more crops can be raised in one season.

467. Volcanoes and Earthquakes.—A few miles from Naples is Vesuvius, a volcanic mountain (Fig. 459). Through the crater in the center and top of the mountain, melted rock or lava sometimes pours out and flows down the slopes. At times there are explosions in the crater, and clouds of dust and of larger fragments are hurled out. These darken the sky, and the stones and dust fall on the mountain slopes and build them up. Lavas and volcanic dust soon break up and make fertile soils, and people have gardens and vineyards and build large towns all around the foot of the mountain. Sometimes a town is partly or wholly destroyed and the people are compelled to leave, but they soon return and build homes again. In the year 79 A.D. a great eruption completely buried two cities, Pompeii and Herculaneum, and in time they were entirely forgotten. After many centuries Pompeii and a part of Herculaneum have been uncovered, the volcanic earth shoveled away, and the streets and many buildings, statues, and even pictures painted on the walls have been found well preserved (Fig. 460).

Fig. 460. House in Pompeii

Vesuvius is a small mountain, only about 4000 feet high, but Etna on the island of Sicily is about two miles high. At its foot are palms and orange trees, on its slopes are oaks and chestnuts, farther up are evergreen trees, and around the top are perpetual snows. Sometimes eruptions melt the snows, and send down streams of lava that endanger the towns and cities near the mountain.

In the Mediterranean, not far from Sicily, is Stromboli, an island volcano that is always sending out steam and other gases. In much of Italy are found volcanic rocks of former ages.

A valuable product of the volcanoes and of the volcanic rocks of Italy, especially in Sicily, is sulphur. Italy produces also about half of the world's quicksilver, as well as some zinc, lead, and iron.

In southern Italy earthquakes are common. In the year 1908 the large cities of Messina and Reggio were almost completely destroyed, and thousands of people were killed by the falling walls.

468. Italian Farming.—The plains of the Po furnish the largest area of good land in Italy. The soil is rich, level, and well watered. Wheat, corn, and rice are the principal Italian grains. The Italians grow large crops of wheat, and make much use of corn, which the poorer classes eat in the form of thick corn-meal mush. Much rice is grown in the Po Valley, where the fields can be easily leveled and the crops flooded when necessary. Italy is the leading European country in the growing of rice, although some is produced also in other countries of the Mediterranean slope, notably in Spain.

Mulberry trees are grown in many parts of Italy, especially on the plains of the Po; and Italy produces more raw silk than France, though it does not manufacture so much. Grapes are almost as abundant as in France, olives are widely raised (Fig. 461), and oranges and lemons are especially abundant in the southern end of the peninsula and in Sicily (Fig. 462). Nuts are extensively grown. About a million acres are covered with chestnut trees, and the people eat the nuts, boiled or roasted, in place of the potato. Nut meal is also used for making bread. Walnuts and hazelnuts are used at home and also exported. The Italians make large use of vegetables, which grow abundantly in their warm climate.

Fig. 461. Olive orchard, Italy. Sheep grazing

More than half of the Italian people are engaged in agriculture. Many of them do a great amount of hand work, turning the soil by hand and beating out wheat with a flail. For centuries they expended an enormous amount of time and labor in building walls and terracing mountain sides for grapes, oranges, and other fruits. White oxen, large and sleek, with long horns, are often seen at work on Italian farms, or drawing wagons in the streets of the cities (Fig. 464).

Fig. 462. Loading ships with lemons, at a wharf in Palermo

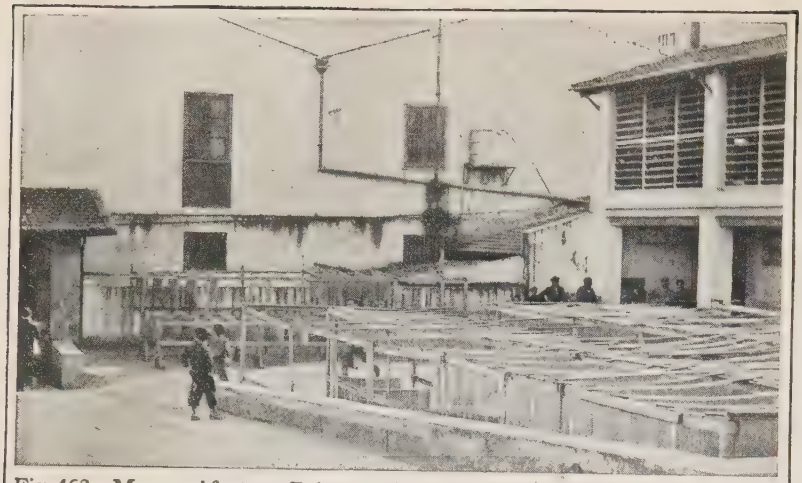

Fig. 463. Macaroni factory, Palermo. The macaroni is hung over frames to dry

469. Manufactures.—The Italians have always made certain things by simple processes, but have also begun to manufacture articles, like textiles and airplanes, that require much skill and the use of complicated machinery. Among the simple manufactures are macaroni and similar bread pastes, made from wheat flour (Fig. 463). The people have long been skillful in plaiting straw, and Florence has been a center for making and selling articles of straw for many hundred years. Thousands of women and children engage in this work. Italians also are expert jewelers, and skillful makers of gloves and lace.

All the salt and tobacco are manufactured and sold by the government. One cannot buy salt at a grocery, as we do in our country, because the government has its own stores for the sale of salt and tobacco, from which it gets a revenue.

Wine is made in immense quantities. Much is used at home, and much is exported. More olive oil is manufactured than in any other country, and the Italians use it in place of butter. The poorer people still use olive oil in their lamps, as all the people did for hundreds and even thousands of years.

Red coral is obtained on some parts of the coast by diving, or by the use of dragnets. It is used in Naples, Genoa, and other cities, in making beads and other ornaments. Some Italians, especially at Rome and Florence, are very skillful in fine metal work, and in making mosaics.

Fine marble is quarried in the mountains around Carrara (Fig. 464), and is exported to many countries and also wrought into building stones, statues, and many kinds of ornamental carved work. Superior work in glass is done near Venice and elsewhere.

Silk is manufactured in Milan and in other parts of the kingdom. Much raw cotton for manufacture is imported from the United States, and the industry is growing. Excellent automobiles are made at Turin.

470. History.—Several centuries before Christ the Greeks founded colonies and built cities in southern Italy. Long before the

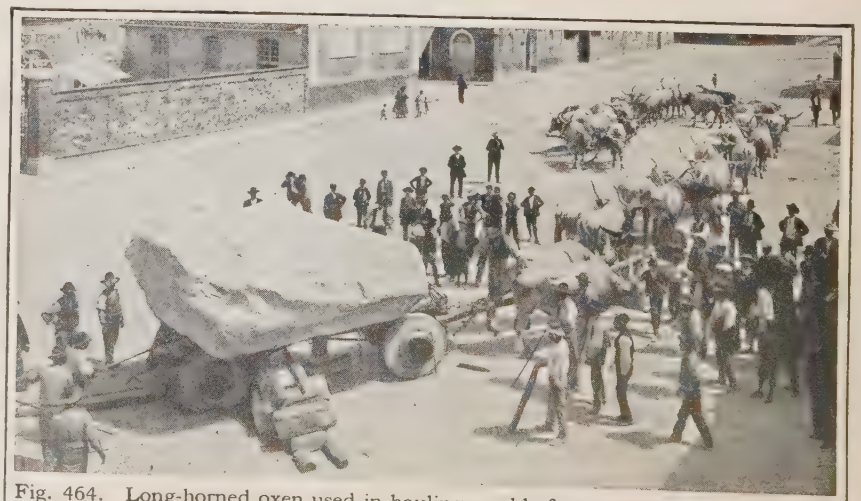

Fig. 464. Long-horned oxen used in hauling marble from the quarries at Carrara

Greeks came, however, there were people who had learned the arts of civilization. Later, in central Italy, the Roman dominion was founded, and at the time of Christ it embraced the civilized world of that period. Still later Italy was divided among various independent kingdoms and republics. Among the independent republics were Venice, Genoa, and Pisa, which sent their trading ships to all parts of the Mediterranean and even to the Black Sea.

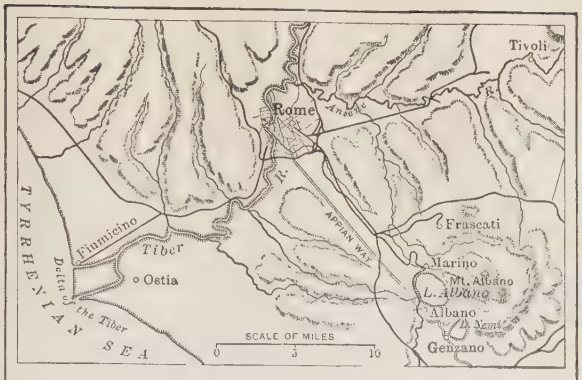

Fig. 465. Rome and vicinity

Italy remained divided until, about sixty years ago, the various parts joined together as the Kingdom of Italy. Some territory also was added after the World War. Italy has several colonies in Africa.

Within the peninsula of Italy is the little independent republic of San Marino, protected by Italy, as Andorra is held neutral by France and Spain. South of Sicily is Malta, a strongly fortified island owned by Great Britain.

471. Cities.—In Rome is the Forum, the market place of ancient Rome. Here may be seen the remains of temples and other public buildings. The rubbish of the old city has been removed from the Forum, and it is fenced in and opened to visitors. Near it are the ruins of the Colosseum, a vast amphitheater, seating thousands of people, who in ancient times gathered there to see contests of men and wild animals (Fig. 466). There are many beautiful churches of more modern times, of which the greatest is St. Peter's (Fig. 382). The Vatican adjoins St. Peter's church. It is a group of buildings in which the Pope resides and in which are galleries of painting and sculpture.

Milan is on the lowland of northern Italy surrounded by rich land, and on the route southward from two of the great railroad tunnels through the Alps. It is the most important manufacturing and trading city of Italy, and contains one of the most beautiful cathedrals of Europe (Fig. 467). In this city, in the dining room of what was once a monastery, Leonardo da Vinci painted on the wall the well-known picture "The Last Supper." Turin also is in the Po Valley. It is joined to the rest of Europe through another of the great Alpine tunnels.

Fig. 466. Colosseum and Arch of Constantine, Rome

Fig. 467. The cathedral at Milan

Fig. 468. Harbor of Trieste

There are four important seaports in northern Italy,—Genoa, Venice, Trieste (Fig. 468), and Fiume. Genoa has a larger commerce than any other Italian coast city. Goods are landed here for Italy and for other countries. Venice is built on many low, flat islands, in a lagoon, or lake, that is separated from the Adriatic Sea by a sand beach. Canals take the place of streets, and boats, including steam and naphtha launches, are used instead of horses or trolley cars. In visiting a hotel or a gallery or house, one lands from a boat and goes into the building, which looks as if it stood in the water. Some of the boats, called gondolas, are propelled by oarsmen who stand as they row. There are many palaces, art galleries, and churches in Venice.

Another important seaport is Leghorn. Near Leghorn is Pisa, an ancient city in which the Leaning Tower still forms one of a group of remarkable buildings. Florence, in the interior of central Italy, is visited by thousands from all parts of the world, because its art galleries and churches contain many of the world's most notable paintings and other works of art.

Naples, the largest city of Italy, is an important seaport, and is visited by many tourists. Palermo is the chief center for the foreign trade of Sicily.

Review. 1. Why has the Po many large tributaries? 2. Where are the "Italian Lakes"? 3. How extensive are the Apennines? 4. What facts can you give about the Tiber?

5. Why has Italy a mild climate? 6. What is the cause of the small rainfall in summer? 7. Tell the story of Pompeii. 8. Name the chief agricultural products of Italy. 9. What is the mode of carrying on the trade in salt? 10. What celebrated places and buildings are in Rome? 11. What are the chief seaports of Italy?

Fig. 469. Transfers of territory in southern Europe

AUSTRIA, HUNGARY, AND CZECHO-SLOVAKIA

	Area, Sq. Mi.	Population	Capital
Austria . . .	30,700	6,131,000	Vienna
Hungary . .	36,000	7,841,000	Budapest
Czechoslovakia	54,700	13,596,000	Prague

Map Study (Figs. 371, 451).—1. Locate Vienna with relation to the Alps and the Carpathians. 2. What river drains nearly all of Bohemia? 3. To what extent is Bohemia bordered by mountains? 4. What city of Czechoslovakia is on the Danube? 5. What countries does the Danube cross? 6. What countries have the Danube as a part of their boundaries? 7. Name two rivers which drain the plains of Hungary. 8. In what respect do the three countries here studied resemble Switzerland? 9. Locate Karlsbad; Innsbruck; Budapest.

472. History.—The former dual monarchy of Austria-Hungary, consisting of two monarchies under the same ruler, extended from the eastern boundary of Germany to the Iron Gate and the Transylvanian Alps; and from the plains north of the Carpathians to the Adriatic Sea. After the World War Austria, Hungary, and Czechoslovakia became independent countries (Fig. 469), and large sections formerly subject to Austria-Hungary became parts of Poland, Rumania, Yugoslavia, and Italy. The new boundaries were determined for the most part on the basis of racial kinship.

473. Austria.—Austria is now reduced to a belt of territory along the Danube, and a part of the eastern Alps. The provinces of Upper and Lower Austria extend along both sides of the Danube from Bavaria to a point eastward from Vienna. The Alpine region includes the Tyrol and other provinces. Trentino in the southern Alps, drained by a branch of the Po River, becomes a part of Italy, as do Trieste and the region bordering the head of the Adriatic Sea.

Fig. 470. Street in Vienna. Billboards like the one shown are common in European cities

The lowlands are not extensive and they lie mainly along the Danube. The Alpine region has many high peaks, deep and narrow valleys, snow fields and glaciers. Innsbruck is a city in the Austrian Alps, much frequented by tourists. From Innsbruck a railway leads into Italy by the Brenner Pass, one of the ancient gateways across the Alps.

The mineral wealth of Austria is not great. Iron is found, especially at Eisenerz in the Alps, where a mountain about a mile high contains much ore. Some coal is mined. The greatest mineral resources, as well as the best agricultural lands of the former Austrian Empire, belong now to other countries.

Austria is now smaller than Pennsylvania in area and population. Most of the people are of German blood and speak the German language. The majority are of the Roman Catholic faith.

At the point where the Danube passes between the east end of the Alps and the west end of the Carpathians stands Vienna, the capital, formerly the capital of the empire (Fig. 470). It is a very large city, but its trade and industries were cut down by the loss of its tributary territory.

West of Austria is the independent principality of Liechtenstein, which has a population of about 10,000.

474. **Hungary.**—Like Austria, Hungary, the other member of the former dual monarchy, has lost large areas, in the north, the east, and the south. The old Hungary included 125,000 square miles of territory; it was larger and had a greater population than our Middle Atlantic States. The present Hungary, like Austria, is smaller than Pennsylvania. Most of its people are true Hungarians or Magyars, descendants of Asiatic people who came to Hungary many centuries ago.

Hungary consists mainly of two plains. The greater plain lies along the Danube in its southward course below Budapest, and along the Tisza, a large tributary of the Danube, which flows from the Carpathians southward and enters the main stream above Belgrade. The smaller plain borders the Danube between Budapest and Vienna.

There is some coal, but the other mineral resources are small. The principal industries are stock raising and agriculture. Wheat and maize are extensively raised on the great central plains, and grapes and tobacco are products of some importance.

The manufactures reflect the agricultural character of the country. Flour milling is highly developed at Budapest, and other industries are brewing and distilling, tobacco curing, the making of beet sugar, and the manufacture of agricultural implements.

Budapest, the capital, is a large and well-built city. Its two parts, Buda and Pest, stand on opposite sides of the Danube (Fig. 471).

Fig. 471. Airplane view of the Hungarian Parliament House at Budapest, overlooking the Danube River

475. **Czechoslovakia.**—Czechoslovakia is the land of the Czechs and Slovaks, two closely related branches of the Slavic race. Though long subject to Austria-Hungary, they preserved their national traditions, held to their own forms of speech, and developed their literature.

The country embraces Bohemia, Moravia, and Austrian Silesia, all former provinces of Austria and inhabited mainly by Czechs. It also includes a large section of northern Hungary, on the slopes of the Carpathians, occupied by the Slovaks. Between Vienna and Budapest the new country extends southward, taking in the former Hungarian city of Pressburg and a section of the Danube plains. Altogether, Czechoslovakia is nearly as large as Austria and Hungary together.

Bohemia, the western part of Czechoslovakia, is bordered by mountainous and hilly uplands. A mountain range, under various names, bends around the province on the west, north, and northeast, while on the southeast a hilly region leads into the province of Moravia. The river Elbe rises in Bohemia and passes through the mountain range on the north, afterwards crossing Saxony and Prussia. Thus Prague and other cities of Bohemia communicate by water as well as by rail with Dresden and Hamburg in Germany.

Moravia lies between Bohemia and the Slovak section of the Carpathians. From the watershed in Moravia the river Oder

flows northward through Germany, and a smaller river flows south to the Danube. Along these valleys is the "Moravian Gateway," a notable route of traffic leading from the Adriatic Sea and the Danube to the Baltic Sea, and much used in ancient as well as in modern times.

The new nation has chosen a republican form of government, and its capital is Prague, the ancient capital of Bohemia. It is a splendid city on a branch of the river Elbe.

Fig. 472. Steel mills in Czechoslovakia

476. Industries of Czechoslovakia.—Bohemia has long been the principal manufacturing district of Austria-Hungary. It has abundant coal to supply power for its iron and textile industries. The streams flowing from the forested upland borders supply much water power. Here is made the celebrated Bohemian glass, and in this province also are the breweries of Pilsen and other places for which the Bohemian farms furnish the necessary hops and barley. In Bohemia are health resorts such as Karlsbad and Marienbad, with mineral springs and hot baths to which people of many countries go for medical treatment. There is kaolin for porcelain, and paper mills utilize the wood from the forests. Silver, radium, and graphite, as well as iron and abundant coal, are found in various sections of the country. Iron and steel are important products of western Czechoslovakia (Fig. 472). The textile industries, including the manufacture of cotton, woolen, and linens, are carried on both in Bohemia and in Moravia.

In the agricultural regions of the country the variety of products is large. Cereals, potatoes, sugar beets, tobacco, hops, and fruits are raised.

477. The Danube River.—The Danube and the Rhine are the chief international rivers of Europe. The Rhine furnishes a trade route for Switzerland, Germany, France, and the Netherlands. The Danube crosses Germany, Austria, Hungary, Yugoslavia, and Rumania, and for long distances forms the southern border of Czechoslovakia and the northern border of Bulgaria. It flows between the Alps and Carpathians at Vienna, and between the Transylvanian Alps and the Balkan Mountains at the Iron Gate. As the waters connecting the Black Sea and the Mediterranean have been internationalized, the Danube has become one of the most important routes of interior navigation in the world.

Review.—1. What changes have taken place in the former Austria-Hungary? 2. Name a tourist center and an important pass in the Austrian Alps. 3. What changes have taken place in the area and population of Hungary? 4. What are the manufactures of Hungary? 5. What parts of the former monarchy of Austria-Hungary are included in Czechoslovakia? 6. Describe the boundaries and drainage of Bohemia. 7. What are the manufactures of Bohemia? 8. For what countries does the Danube afford a trade route? 9. What is the Iron Gate?

THE BALKAN COUNTRIES

	Area, Sq. Mi.	Population	Capital
Yugoslavia	95,000	12,017,000	Belgrade
Rumania	116,000	17,393,000	Bucharest
Bulgaria	40,000	4,910,000	Sofia
Albania	11,000	832,000	Tirana
Greece	42,000	4,932,000	Athens
Turkey in Eur.	10,000	1,800,000	

Map Study (Figs. 371, 451).—1. Bound Bulgaria; Greece; Rumania. 2. Locate the capital of Rumania; of Yugoslavia. 3. Locate the Bosporus; the Sea of Marmora; the Dardanelles. 4. Locate Athens; Salonica; Constantinople; Sofia; Belgrade. 5. Where, on the Danube, is the Iron Gate? 6. State an important difference between the Balkan and the Italian coast lines of the Adriatic Sea. 7. What is the character of the surface and of the shore line of Greece? 8. Compare Yugoslavia, in size, with Rumania; with Czechoslovakia; with Bulgaria.

478. Physical Features.—The Balkan Peninsula is sometimes likened to a bridge joining Europe to Asia. It faces Asia across three seas — the Black Sea, the Sea of Marmora, and the Aegean — and is bordered also by the Adriatic Sea and the Mediterranean. Its northern boundary is vague, but may be described as extending from Fiume on the northern Adriatic, eastward along the Save and Danube rivers, to the Black Sea.

The land is mountainous, but among the mountains there are many beautiful valleys and old lake basins. In the west are the Dinaric Alps. This range of highlands continues the folds of the Alps southeastward into Greece. The Balkan Mountains are in the northern and eastern part of the peninsula, in Bulgaria and eastern Yugoslavia. Extending south and east from the Iron Gate (Sec. 383), they may be regarded as a continuation of the great Carpathian range.

479. History of the Balkan Region.—This part of Europe has been for thousands of years in close relation to Asia. Across the narrow waters that join the Black and Aegean seas, men have gone for trade, for settlement, and for war and conquest. The land route from southern Europe to southwestern Asia leads through the Balkans, and a trunk railroad connects Constantinople with the Danube trade route at Belgrade. A branch line joins Nish and Salonica.

The whole Balkan region fell under the control of the Turks several hundred years ago, but the cruelty of their rule caused one group of people after another to rebel and set up independent governments. A further blow to the Turkish power in Europe came in a war with the adjacent countries of the peninsula in 1912–1913. The Turks were then compelled to give up about five sixths of their European possessions, retaining only a small area in the east. The greater part of the conquered territory was divided among Greece, Serbia, Montenegro, and Bulgaria, the four kingdoms that had carried on the war. A small region on the Adriatic Sea was given an independent existence as Albania.

As a result of the World War, the kingdom of Yugoslavia was formed, including Serbia, Montenegro, and several southern provinces of the former Austria-Hungary. Rumania was doubled in size, and Greece gained territory from Bulgaria and from Turkey.

480. Yugoslavia.—This is the kingdom of Serbs, Croats, and Slovenes, and is some-

Fig. 473. Town in Bosnia, Yugoslavia

times referred to as the greater Serbia. These three peoples are, as the name Yugoslavia indicates, Slavs of the southern or Balkan region, thus contrasting with the northern Slavs of Czechoslovakia, Poland, and Russia. The Serbs live in the eastern part of the country, not only in the old Serbia but also in Montenegro, Bosnia, and other provinces. The Croats and Slovenes, in Croatia and other western provinces, are closely akin to the Serbs in blood and in language.

The northern boundaries of Yugoslavia are mainly on the plains north of the Drave and Danube rivers. The country has a considerable section of the Dalmatian coastline between Albania and the upper Adriatic region of Italy. Most of the ports on the Adriatic, however, are difficult of access from the interior, because the rugged ridges of the Dinaric range everywhere follow the coast line. The railroads of the peninsula already referred to furnish overland trade routes through the Morava and Vardar valleys to Constantinople and Salonica. Other railroads lead across the Dinaric Alps to the port of Fiume.

Much of Yugoslavia is a tangle of mountains and valleys, and has no natural center from which all parts are easily reached. Its material resources have remained largely undeveloped because of the oppression to which the people have been subjected under the rule of both Turkey and Austria-Hungary.

The people are mainly devoted to agriculture, for which the soils and climate of the mountain valleys are well suited. Wheat and corn are important crops, and there is much fruit, especially grapes and plums. Cereals, prunes, prune marmalade, timber, and swine are important exports.

Coal and copper are important mineral products, and the mountain regions of the greater Serbia will, no doubt, when explored and developed, yield a large output of mineral wealth. Carpet weaving and flour milling are the chief manufacturing industries.

Fig. 474. Threshing wheat in Rumania

481. Rumania.—The kingdom of Rumania is usually called one of the Balkan countries, although only a small part of it, in the southeast, is in the Balkan Peninsula. Prior to the World War Rumania was a little larger than the state of Pennsylvania and had about an equal number of people. Other millions of Rumanians, however, were subjects of Austria-Hungary and Russia, and after the war the adjoining regions, where Rumanians predominate, were added to Rumania. From the tables on pages 321, 324, compare Rumania in size and population with other countries of southern Europe.

The old Rumania was mainly a plain on the north bank of the Danube, rising in the north to the crest of the Carpathians, there known as the Transylvanian Alps. This plain bordered in the east on the Black Sea and on Russia, from which it was separated by the Pruth River. By the new arrangement Rumania acquires the old Hungarian mountain region of Transylvania and reaches westward into the Hungarian plain. It also acquires the Russian province of Bessarabia, and Bukowina, a former province of Austria lying on the northeastern slope of the Carpathians.

The Rumanians, although partly Slav by race, claim to be descendants of ancient

Fig. 475. Market day in Sofia

Roman colonists; they speak a language derived largely from Latin.

The Rumanian plain has hot summers and cold winters, with a rainfall of about 20 inches. It is therefore continental in climate, like Russia. There are extensive forests, especially in the Bukowina and Transylvanian highlands. They include oak, beech, plane, and ash. Lignite is mined, some salt is produced, and much petroleum is exported. Glass making is an industry of importance, and in Bukowina and Transylvania there are paper and leather industries.

The plains of Rumania are very productive and, as in Hungary and Russia, the crops of wheat, corn, and other grains are large. Petroleum and various grains are important exports to Great Britain. Galatz on the Danube is a wheat-exporting city. Bucharest is the capital and largest city. Transportation is afforded by extensive railroad lines and by means of ships on the Danube River and on the Black Sea.

482. **Bulgaria.**—Before 1908 Bulgaria was a principality tributary to Turkey. In that year an independent kingdom of Bulgaria was established. Sofia, the capital (Fig. 475), has about 150,000 inhabitants. The country is nearly as large as Ohio. It has ports on the Black Sea, and is crossed by the trunk railroad leading to Constantinople.

The population includes, in addition to the Bulgarians, many Turks, Rumanians, Greeks, and Gypsies. Such a mixture of races is common in all the Balkan countries, and in connection with Turkish misrule has been the cause of much disorder. Education has been generally neglected, and modern industry has made little progress.

Three fourths of the people in Bulgaria till the soil, and live on farms of a few acres each. Wheat and corn are the leading grains. Tobacco, silk, and sugar beets are produced. The climate south of the Balkan range is mild, and favors the growth of rice and especially of roses, used in making the perfume attar of roses. Coal and iron are mined, and there are some manufactures of cotton and wool.

483. **Albania.**—The new country of Albania, formed from Turkish territory in 1912, has been the home of the Albanian people for many centuries. The people are divided in religious faith, some being Mohammedans and some Christians. Tirana is the capital. There is little or no manufacturing, agriculture is of the most primitive kind, and there are no railroads, though certain lines are projected. Valuable mineral deposits exist, but are not worked.

484. **Greece.**—The republic of Greece is larger than the state of Ohio, but has a smaller population.

The ancient Greeks were the leaders of the world in poetry, philosophy, science, architecture, and sculpture. They founded colonies in other Mediterranean lands, and taught the ruder Roman people much that made them great.

Athens, an ancient city, is the capital of modern Greece. It still possesses the ruins of the Parthenon (Fig. 476), one of the most beautiful of ancient temples. The city is several miles inland, and its port is Piraeus. Salonica, the Thessalonica of the Bible, is a large and important seaport; it was acquired as a result of the recent Balkan wars. After

the World War, Greece gained further territory in the northeast. Elementary education is compulsory, and the University of Athens enrolls several thousand students.

Greece is a land of mountains and valleys, much broken by inlets of the sea. The Isthmus of Corinth is but a few miles wide, and a ship canal has been cut across this neck of land.

Only about one fifth of the land surface is capable of cultivation. The climate is dry, and in some districts irrigation is necessary. The small dried grapes known as "currants" are the leading product and the chief export. Olives are next in importance. Figs and tobacco are also raised, and several million bushels of wheat; but much wheat is imported.

The country has a variety of metals, including iron, copper, zinc, and lead.

Greeks own much shipping in the Mediterranean Sea and control a line of steamships to New York.

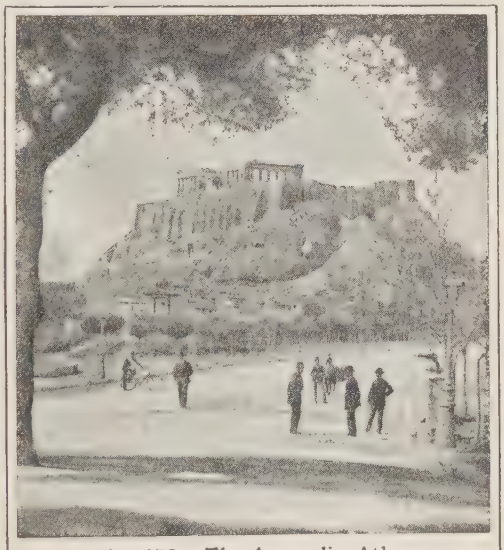

Fig. 476. The Acropolis, Athens

Fig. 477. Mosque of Suleiman, Constantinople

485. **Turkey.**—European Turkey is but a small remnant of the great territory which the Turks once controlled in Europe. Most of the territory lost was lost because of the harsh treatment of the native people. The former rule of the Sultans has been abolished and Turkey is now a republic. The capital of Turkey is Angora in Asia Minor.

Constantinople, on the Bosporus, is by far the largest city of the Balkan Peninsula, and is one of the most ancient and celebrated cities of Europe (Fig. 451). Here the Greeks founded a city 700 years before Christ, and called it Byzantium. The name was changed to Constantinople by the Roman emperor Constantine, and he made it the capital of the Roman Empire. Its best-known buildings are the great Mohammedan mosques, or places of worship (Fig. 477), and the palace of the Sultans, the former rulers of the country. The population includes people of many races.

Turkish industries and trade are in a backward condition. Large numbers of ships enter and clear from the harbor of Constantinople each year, but their trade is largely with ports situated on the Black Sea. There are large fisheries in the Bosporus.

Review.—1. What Balkan countries have the Danube as part of their boundaries? 2. What are the chief products of Yugoslavia? 3. What are the industries of Rumania? 4. Tell the recent history of Bulgaria. 5. In what did the ancient Greeks excel? 6. Give an account of the Greek population and industries at the present time. 7. Give some facts about the history of Constantinople. 8. Why is its situation important?

ATLANTIC OCEAN
ARCTIC OCEAN
NORTH SEA
Baltic Sea
BLACK SEA
Sea of Azof
Caspian Sea
Aral Sea
Lake Aral
Hammerfest
North Cape
Tromsö
Vardo
Narvik
Murmansk
Kolguef I.
Nova Zembla
Vaigach I.
Arctic Circle
Lofoten Is.
Christiansund
Trondhjem
Bergen
Stavanger
Oslo (Christiania)
Christiansand
Skagerrack
Kiölen Mts.
Lapland
Kola Peninsula
Kanin Peninsula
Mezen
Archangel
White Sea
Gulf of Bothnia
Umea
Vasa
Tornea
Kolari
Luleå
Uleaborg
Kem
Onega R.
Dwina R.
Pechora R.
Ural Mts.
Obdorsk
Gulf of Ob
Surgut
Ob R.
Siberia
Tammerfors
Helsingfors
Hango
Aland Is.
Abo
Gulf of Finland
Petrozavodsk
L. Onega
L. Ladoga
Kotlas
Ustyug Veliki
Forest Region
Solikamsk
Tobolsk
Irtysh R.
Irbit
Tyumen
Stockholm
Sweden
Reval
Estonia
Narva
Kronstadt
Leningrad (Petrograd)
Vologda
Vyatka
Perm
Ekaterinburg
Omsk
Petropavlovsk
Chelyabinsk
Troitsk
Goteborg
Copenhagen
Malmo
Bornholm
Latvia
Riga
Lithuania
Kovno
Tartu
Novgorod
Valdai Hills
Yaroslave
Ivanovo Voznesensk
Nizhni Novgorod
Kazan
Ufa
Zlatoust
Petrograd
Hamburg
Bremen
Berlin
Leipzig
Dresden
Konigsberg
Danzig
Memel
Grodno
Vilna
Minsk
Bialystok
Pinsk
Moscow
Vitebsk
Borodino
Smolensk
Kaluga
Tula
Ryazan
Penza
Samara
Orenburg
Orsk
Turgai
Kirghiz Steppe
Poland
Warsaw
Lodz
Brest Litovsk
Lublin
Krakow
Prague
Vienna
Austria
Hungary
Carpathian Mts.
Danube R.
Gomel
Orel
Kozlof
Tambof
Petrovsk
Saratof
Uralsk
Kursk
Voronezh
Industrial Region
Black Earth Region
Zhitomir
Lemberg
Kamenets Podolsk
Berdichef
Kief
Kharkof
Poltava
Kremenchug
Dniester R.
Bug R.
Dnieper R.
Elizavetgrad
Ekaterinoslaf
Krivoi Rog
Tsaritsyn
Kalmikof
Ural R.
Nikolaief
Taganrog
Don R.
Rostof
Kalmuk
Astrakhan
Kazalinsk
Syr R.
Perovsk
Turkestan
Ust-Urt Plateau
Amu R.
Kherson
Berdiansk
Odessa
Crimea
Kertch
Kuban R.
Krassnodar
Sebastopol (Achair)
Kertch Strait
Rumania
Galatz
Bucharest
Bulgaria
Varna
Caucasus Mts.
Vladikavkaz
Tiflis
Caucasia
Abchasia
Daghestan
Kuma R.
Manych Depression
Caspian Depression
Elburz Mts.
Kara Bugaz Gulf
Fig. 478. Physical and Political
EASTERN EUROPE
Scale of Statute Miles
0 50 100 200 300 400 500
320 MILES TO ONE INCH
Capitals of Countries: ◎ Principal Railroads:
ELEVATIONS IN FEET
OVER 5000
2000 TO 5000
1000 TO 2000
500 TO 1000
SEA LEVEL TO 500
BELOW SEA LEVEL
COPYRIGHT, BY AMERICAN BOOK COMPANY
20° Longitude East 30° from Greenwich 40°

Fig. 479. The Kremlin, a walled area in the center of Moscow, containing many public buildings

EASTERN EUROPE

	Area, Sq. Mi.	Population	Capital
Russia, etc. .	1,716,500	93,782,000	Moscow
Finland . .	130,000	3,367,000	Helsingfors

Map Study.—1. How many degrees of longitude are covered by Russia? How many degrees of latitude? 2. What countries border Russia on the west? 3. What ocean and what seas and gulfs are on the boundary?

4. Using the scale of miles, determine the width of the Caspian Sea. 5. What long river flows into it? 6. What city is at the mouth of this river? 7. What river flows into the Sea of Azof? 8. What large river flows into the Black Sea?

9. Locate Moscow, Nizhni Novgorod, Leningrad. 10. Name the chief seaport on the Black Sea. 11. Where is the peninsula called Crimea?

12. What part of Russia has many lakes? 13. Compare the latitude of Russia with that of the United States; with that of Canada. 14. How do most of the rivers flow with reference to the center of the country?

15. What waters border Finland? 16. Locate the capital of Finland.

Fig. 480. Boat on the Dnieper River at Smolensk

486. Physical Geography.—East of Germany, the central plain of Europe widens and embraces the eastern half of the continent. The greater part of this eastern plain belongs to Russia. The highest land is in the center, where the rivers rise. But even this region is flat and less than 1100 feet above the sea.

The rivers are long and descend very slowly to the sea. For this reason Russia has many thousands of miles of interior navigation (Fig. 480). The Volga, which flows into the Caspian Sea, is one of the world's greatest rivers. In its lower course it flows through a large region that is below the level of the ocean.

The Ural Mountains are on the east border, but they are so low and have such gentle slopes that they do not form a real barrier. No mountains are visible in crossing by rail from Russia to Siberia. Some geographers consider the Caucasus Mountains as part of the southern boundary of Europe. Others place that boundary between the Caspian Sea and the Sea of Azof, at the valley of the Manich, as shown in this book (Figs. 371, 478).

Fig. 481. Sledge and ponies in a North Russian village

Although the Caspian Sea receives the water of the longest river of Europe, the region is so dry that few other streams enter the sea, and its surface is kept by evaporation 85 feet below the level of the ocean. It has no outlet, and its waters are salt like those of Great Salt Lake. The Black Sea receives large rivers, and is connected with the Mediterranean Sea. Its waters are brackish.

As in Scandinavia and north Germany, so in Finland and in northern and western Russia, an ancient ice sheet swept over the surface. By this agency thousands of lakes were formed.

487. **Climate and Vegetation.**—The range of latitude is so great that eastern Europe is cold in the north, temperate in the middle, and warm-temperate in the south. The climate is continental, for the land is far from the Atlantic, and the westerly winds do not give even temperatures as they do in western Europe. The winters are cold, and the summers are hot. The rainfall varies greatly in different parts of Russia; it is moderate in the central and western parts, and lighter — less than 20 inches — in the north, east, and south. But in most of Russia there is usually enough moisture for good crops because the rains fall mainly in the summer.

In the north is a belt of tundra or Arctic plains. Farther south is an extensive forest belt, of birch, beech, oak, fir, and pine. This belt is so extensive that lumber interests in Russia and Finland are large.

In central and southern Russia is the fertile region of the so-called "black earth." This is a deep and rich soil, resembling that of our prairies, and especially suitable for raising wheat and other grains. Here the population is dense. In the southeast, around the Caspian Sea, is the steppe region, where the land is too dry for farming; some parts of it are below sea level. The population of this region is sparse.

488. **Russia.**—Before the World War European Russia had about 140,000,000 people. The Russian Empire included also Siberia, Turkestan, Caucasus, and some other regions in Asia; the total population was 175,000,000 and the area larger than that of the mainland of North America. As a result of the war the monarchical government was overthrown and the western parts of the old empire became independent countries.

The greater part of Russia fell under the control of extreme radicals, who framed for it a government by soviets, or councils of union workmen. It is the largest country of Europe. Most of its inhabitants are Great Russians, the most numerous people of the Slavic group. Many parts of Russia occupied by other peoples — such as Ukraine, White Russia, Karelia, etc. (Fig. 478) — were given local governments of their own, under soviet control.

Russia is a backward country, and until about sixty years ago many of its peasants were serfs. The roads and the schools are poor. The peasants' ways of living are very simple and rude (Figs. 481, 482).

The prevailing worship is in the forms of the Orthodox Church.

489. Russian Agriculture.—Russia is primarily an agricultural country and most of its people are engaged in farming.

During the long Russian winters there is not much work on the farms, and some of the land owners live in the cities or carry on industries and trade. Farm produce is often marketed by means of sledges which can be easily drawn over the snow-covered ground.

Fig. 482. Russian farmers in a sugar beet field

Wheat is grown in the "black-earth" region of Russia. Much rye is raised, and the peasants use rye bread. Barley, oats, and flax also are leading crops. The flax is grown both for fiber and for making linseed oil. Hemp, another and taller fiber plant, is an important product. Potatoes and sugar beets are the most common vegetables.

The farmers generally use primitive methods and rude tools, but in many places modern agricultural tools and machines have been introduced. The modern implements have come partly from the United States.

490. Mines and Manufactures.—Iron and coal are found in several parts of Russia and considerable iron is manufactured. In the Ural Mountains many metals are mined, including the very hard and valuable metal, platinum, of which Russia furnishes an important part of the world's supply.

Fig. 483. St. Basil's Church, Moscow

The largest manufacturing center of Russia is in and near Moscow. The use of manufacturing machinery is very limited, and, as in other backward countries, many things are still made by hand. But in Moscow and Leningrad, and to a lesser extent elsewhere, machinery has been introduced, and before the World War the textile industries had reached a flourishing condition. One of the largest of these was cotton manufacturing, for which Russia imported much raw cotton from our southern states. The war and ensuing difficulties brought most of the Russian factories to a standstill; but the country has so many people and can supply so much cheap labor that manufactures are likely to increase.

491. Cities and Routes of Trade.—Moscow, the capital of Russia, is in the central part of the country and is the chief railroad center. Railroads lead north to Archangel, northwest to Leningrad and thence to Murmansk, west to Warsaw and Berlin, and south to Odessa and Sebastopol. Another line extends eastward into Asia, and crosses Siberia to Vladivostok on the Pacific. Not far from Moscow are ports on the Volga, which is navigable to its mouth. The Orthodox Church,

Fig. 484. Shipping on the Neva River, in Leningrad

which is the national church of Russia, has its principal seat in Moscow, and this city is known as the "holy city" of the empire (Figs. 479, 483). It has many palaces and a large university.

Leningrad, formerly named St. Petersburg, then Petrograd, is at the mouth of a short river called the Neva (Fig. 484). It was the capital of the old Russian Empire. It is second only to Moscow as a manufacturing center. Leningrad and other ports on the Baltic are closed by ice for many weeks of the winter; for the shallow, brackish water (Sec. 382) is easily frozen.

Nizhni Novgorod, east of Moscow, has every year the greatest of the Russian fairs. These are not, as in our country, places for showing fine products for which prizes may be awarded, but places where, for centuries, people have come from all parts of the country bringing their goods for sale. We should call them markets. Astrakhan is a center for fisheries and a starting point for Persian trade. Archangel receives and sends out the natural products of the colder parts of Russia, lumber, flax, and some kinds of grain. It is icebound for several months of each year.. Murmansk, the terminus of a Russian railroad built during the World War, is a port open all the year.

Kief, an ancient city on the Dnieper River, is a center for linen and woolen manufactures and for the wine trade. Odessa, on the Black Sea, is the chief southern seaport. It receives much of the Russian wheat crop and exports both grain and flour. Taganrog, on the Sea of Azof, also ships much wheat.

Although Russia has several seaports it is not well situated for trade by ocean ships. The open Arctic Ocean at Murmansk is reached only by a long railroad through barren country. Both the White and Baltic seas are closed by ice for a long time during the winter months. The Black Sea ports can be reached only by way of narrow straits

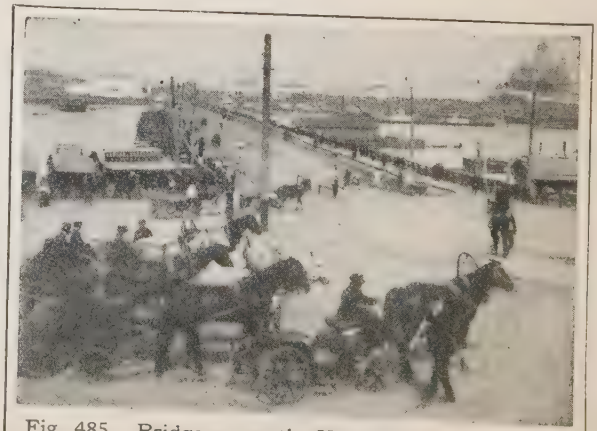

Fig. 485. Bridge across the Volga, Nizhni Novgorod

Fig. 486. Cutting seed potatoes, Ukraine

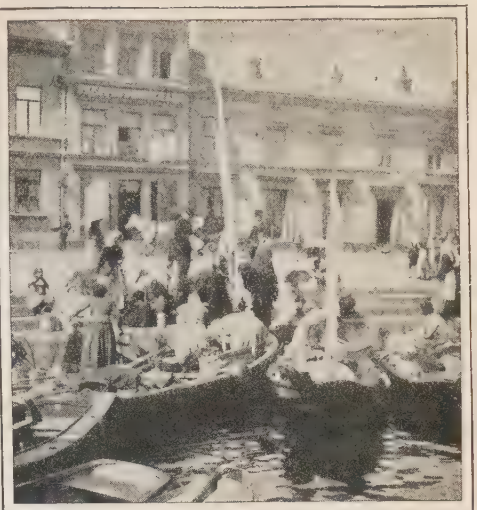

Fig. 487. Market boats, Helsingfors, Finland

through which freedom of trade is impossible when they are held by unfriendly powers. But with its enormous size, its multitude of people, and its varied resources, a well-governed Russia should have a great future.

492. Ukraine.—The southern part of Russia, known as Ukraine, gained temporary independence but in 1920 fell under the soviet government of Russia. This region embraces a large part of the plains of southern Russia and includes most of the "black earth," which in richness and fertility is like the prairie soils of America. These lands produce large crops of wheat and other cereals and of vegetables (Fig. 486). In the valley of the Donetz are rich mines of coal and iron. The people of Ukraine, differing slightly from the Great Russians in race and language, are known as Little Russians.

493. Finland.—Finland lies north of the Gulf of Finland, and is separated from Sweden on the west by the Gulf of Bothnia.

The Finns are Asiatic in race and in their speech, and were for several centuries subject to Sweden. Finland was ceded to Russia in 1809, but enjoyed a good degree of self-government until 1898. Oppression by Russia followed, until the World War gave the Finns opportunity to declare their independence. They have now adopted a republican form of government. The people are advanced in education and industry. There is some mixture of Swedes in the population, and nearly all the people are Protestant.

Helsingfors (Fig. 487) is the capital and the largest city. Lumbering, farming, and dairying are leading industries, and the large forest resources have led to woodworking and paper making.

Review. — 1. Describe the surface of eastern Europe, from the Arctic Ocean to the Black Sea. 2. Describe the seas on the southern border.

3. What part of our country resembles Russia in climate? 4. Where are the principal forests? 5. Where is the black-earth region?

6. Who are the principal people of Russia in Europe? 7. Give an account of the government.

8. What grains are raised in Russia? 9. What grain is used in making the bread of the working people? 10. What vegetables are raised? 11. What valuable metal is found chiefly in Russia? In what part? 12. Name the leading manufacturing cities. 13. Why are manufactures likely to increase?

14. Name three Russian seaports. 15. Name the leading railroad center and the cities to which the principal lines extend. 16. What city is the capital of Russia?

17. Who are the principal people of Ukraine? 18. What are the chief industries?

19. What are the leading industries of Finland?

ARCTIC OCEAN
ATLANTIC OCEAN
PACIFIC OCEAN
INDIAN OCEAN
Arctic Circle
Equator
Tropic of Cancer
Europe
Asia
Africa
Arabian Sea
Bay of Bengal
China Sea
Java Sea
Banda Sea
Arafura Sea
Celebes Sea
Sulu Sea
Yellow Sea
East China Sea
Japan Sea
Sea of Okhotsk
Bering Sea
Caspian Sea
Black Sea
Mediterranean Sea
Red Sea
Persian Gulf
Gulf of Aden
Gulf of Siam
Gulf of Tonkin
Gulf of Oman
Gulf of Suez
Gulf of Aqaba
Gulf of Suez
Gulf of Aqaba
Gulf of Suez
Gulf of Aqaba

ASIA

	Area, Sq. Mi.	Population	Capital
Turkey in Asia	295,000	10,000,000	Angora
Syria	80,000	3,000,000	
Palestine	9,000	757,000	Jerusalem
Iraq	140,000	2,850,000	Bagdad
Hedjaz	140,000	600,000	Mekka
Aden, etc.	15,870	177,000	Aden
Oman	75,000	500,000	Maskat
Arabia (interior)	906,500	2,000,000	
Persia	635,000	9,500,000	Teheran
Afghanistan	240,900	6,380,000	Kabul
Indian Empire	1,856,500	319,075,000	Delhi
Nepal	54,000	5,600,000	Khatmandu
Bhutan	18,600	250,000	Punakha
Ceylon, etc.	25,500	4,568,000	Colombo
Siam	245,000	8,266,000	Bangkok
Fr. Indo-China	256,500	17,269,000	Hanoi
Straits Settlements, etc.	35,600	2,377,000	Singapore
East Indies	788,000	60,694,000	
China, etc.	4,300,000	320,880,000	Peking
Japanese Empire	261,300	77,606,000	Tokyo
Russia in Asia	6,721,500	41,037,000	

Map Study.—1. What is the latitude of Singapore, at the southern end of the Malay Peninsula? Of Cape Chelyuskin? 2. What is the difference in longitude between Smyrna in Asia Minor, and Bering Strait?

3. Where has Asia a land communication with Africa? 4. Name three great peninsulas on the south border of Asia (Fig. 489). 5. Give the water boundaries of the most westerly of these; of the middle one; of the most easterly. 6. Name and give the water boundaries of two peninsulas on the east border of Asia. 7. Beginning with the Caspian Sea, name in order the principal seas, gulfs, and bays along the border of the continent.

8. Through how many degrees of latitude does the island group of the Empire of Japan extend? 9. Locate Ceylon, Sumatra, Borneo, and the Philippine Islands.

10. Name in their order from east to west the three principal rivers that flow into the Arctic Ocean. 11. Describe the course of the Amur River, the Hwang, and the Yangtze. 12. Name two rivers that flow southward in Burma. 13. Name two rivers whose waters join before they enter the Bay of Bengal. 14. Describe the course of the Indus. Into what sea does it flow? 15. Name two rivers whose waters join before they enter the Persian Gulf.

16. Locate the Himalaya Mountains; the Tien Shan; the Altai Mountains; the Caucasus Mountains. 17. Compare, as regards rivers, the interior of Asia with the interior of North America. 18. Name and locate three large lakes in Asiatic Russia.

19. What countries border Asiatic Russia on the south? 20. What countries border British India? 21. Locate French Indo-China; the Straits Settlements; Oman; Aden. 22. Locate Manchuria; Mongolia; Tibet. 23. What two regions bear the name Turkestan?

24. Locate the capitals of China, Persia, British India, Siam, and the Empire of Japan. 25. Locate Jerusalem, Mekka, and Damascus in southwestern Asia. 26. Name and locate two important seaports of India. 27. Locate Hongkong, Canton, Shanghai, and Hankow in eastern Asia. 28. Locate Tomsk and Vladivostok in Asiatic Russia.

29. What countries of Asia are wholly or partly south of the Tropic of Cancer?

PHYSICAL GEOGRAPHY

494. Asia as a Continent.—Asia is nearly twice as large as North America and more than four times as large as Europe. Asia and Europe belong together when we think of them as a land surface, for they have a long land boundary in common; and they are sometimes included together under the name Eurasia. But when we consider their history, their people, and their trade, they may rightly be called separate continents.

Asia is more distinct from Africa than from Europe, being joined to Africa only by the Isthmus of Suez. But the peoples of Asia and those of northern Africa have had much intercourse with each other for thousands of

ATLANTIC OCEAN
ARCTIC OCEAN
PACIFIC OCEAN
INDIAN OCEAN
EUROPE
ASIA
AFRICA
AUSTRALIA
EAST INDIES
Eurasian Plain
Arctic Circle
Tropic of Cancer
Equator
Mediterranean Sea
Black Sea
Caspian Sea
Red Sea
Arabian Sea
Bay of Bengal
South China Sea
Yellow Sea
East China Sea
Sea of Okhotsk
Sea of Japan
Gulf of Anadir
Bering Sea
Gulf of Aden
Persian Gulf
Gulf of Oman
Gulf of Tonkin
Celebes Sea
Banda Sea
Java Sea
Sulu Sea
Timor Sea
Arafura Sea
Alps
Ural Mts.
Kirghiz Steppe
Altai Mts.
Plateau of Mongolia
Gobi Desert
Plateau of Tibet
Kuenlun Mts.
Trans Himalaya Mts.
Himalaya Mountains
Mt. Everest 29,002
Mt. Godwin Austen 28,250
Mt. Demavend 18,998
Hindu Kush
Plateau of Iran
Plateau of Arabia
Peninsula of Arabia
Arabian Desert
Libyan Desert
Nubian Desert
Deccan Plateau
Peninsula of India
Malay Peninsula
Indo-China Peninsula
Lake Baikal
Lake Aral
Lake Balkash
Lake Koko-Nor
Lake Tali
Lake Van
Lake Urmia
Caspian Depression
Turfan Depression
Dead Sea
Taymyr Peninsula
Kamchatka Peninsula
Sakhalin I.
Japan Islands
Honshu
Kiushu
Hokushu
Yezo
Taiwan (Formosa)
Hainan
Luzon
Philippine Islands
Mindanao
Palawan
Molukka Is.
New Guinea
Borneo
Celebes
Sumatra
Java
Timor
Ceylon
Andaman Is.
Nicobar Is.
Laccadive Is.
Maldive Is.
Sokotra
Kuriles
Aleutian Is.
Novaya Zemlya
Spitzbergen
Franz Josef Land
New Siberia Is.
Nansei Is.
Sunda Islands
Sunda Strait
Strait of Malacca
Strait of Bab-el-Mandeb
Strait of Ormuz
Formosa Strait
Korea Strait
Behring Strait
Suez Canal
Nile R.
Euphrates R.
Tigris R.
Indus R.
Ganges R.
Brahmaputra R.
Irrawaddy R.
Salween R.
Mekong R.
Menam R.
Hoang-ho R.
Yang-tse-kiang R.
Si-kiang R.
Amur R.
Lena R.
Yenisei R.
Ob R.
Irtysh R.
Volga R.
Dnieper R.
Don R.
Danube R.
Ural R.
Amu R.
Syr R.
Helmand R.
Kabul R.
Cape Chelyuskin
North Cape
C. Deshnev
C. Lopatka
C. Negrais
C. Comorin
C. Romania
C. Cambodia
C. Hadd
Isthmus of Kra
Gulf of Siam
Gulf of Martaban
Gulf of Manar
Palk Strait
Eastern Ghats
Western Ghats
Ramu of Cuttack
Kirthar Mts.
Sulaiman Mts.
Elburz Mts.
Zagros Mts.
Taurus Mts.
Caucasus Mts.
Carpathian Mts.
Pyrenees Mts.
Alps
Apennines
Atlas Mts.
Kuen-lun Mts.
Hindu Kush
Himalaya Mts.
Ural Mts.
Khingkhan Mts.
Yablonoi Mts.
Stanovoi Mts.
Verkhoyansk Mts.
Kolyma Mts.
Anadir Mts.
Kamchatka Mts.
Kurile Is.
Yablonoi Mts.
Nanling
Yunling
Fuji-yama 12,379
Ararat 16,916
Kilimanjaro 19,720
Kenia 18,370
Ruwenzori 16,810
Elgon 14,000
Cameroon Mt. 13,760
Pico de Teide 12,198
Mt. Blanco 15,781
Jungfrau 13,671
Monte Rosa 15,217
Etna 10,874
Vesuvius 4,000
Olympus 9,754
Parnassus 8,068
Mt. Sinai 8,571
Mt. Hermon 9,166
Mt. Lebanon 10,000
Mt. Ararat 16,916
Mt. Demavend 18,998
Mt. Godwin Austen 28,250
Mt. Everest 29,002
Kanchinjinga 28,156
Nanga Parbat 26,629
Dhaulagiri 26,826
Annapurna 26,492
Gosainthan 26,291
Kamet 25,447
Nanda Devi 25,661
Trisul 23,406
Kinchinjunga 28,156
Mt. Kenia 18,370
Mt. Kilimanjaro 19,720
Mt. Ruwenzori 16,810
Mt. Elgon 14,000
Mt. Cameroon 13,760
Pico de Teide 12,198
Mt. Blanco 15,781
Jungfrau 13,671
Monte Rosa 15,217
Mt. Etna 10,874
Mt. Vesuvius 4,000
Mt. Olympus 9,754
Mt. Parnassus 8,068
Mt. Sinai 8,571
Mt. Hermon 9,166
Mt. Lebanon 10,000
Fig. 489
Physical
ASIA
ELEVATIONS IN FEET
OVER 15000
15000 TO 5000
5000 TO 2000
2000 TO 1000
1000 TO SEA LEVEL
SEA LEVEL TO 1000
LAND BELOW SEA LEVEL
Depths in Fathoms
0 to 100
100 to 1000
1000 to 2000
over 2000
Scale of Statute Miles
0 500 1000
945 MILES TO ONE INCH
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Longitude 80° East from 90° Greenwich

Fig. 490. Snow and glaciers on the Himalayas

years, because it has been easy for them either to pass over the Isthmus of Suez or to cross the Mediterranean or the Red Sea by boat.

In northern Asia are the vast plains of Siberia, but these plains are not so valuable as those of North America, South America, or Europe, because a large part of the region is so far north. In Asia there are large areas in the North Temperate Zone, but excepting eastern China, this region is generally either very dry or too high and cold for agriculture. The hot lands of Asia, however, have much greater area and are more important than those in the hot belt of North America.

495. Surface and Rivers.—The surface is high in the interior and, as a rule, low near the borders. Asia thus differs from Europe and North America, which have their large lowlands in the interior and their mountains on or near the borders.

The Himalaya Mountains (Fig. 490) extend east and west and contain the highest peaks on the globe. Hundreds of peaks, and even some ranges, are more than 20,000 feet high, and Mount Everest, believed to be the highest in the world, is about 29,000 feet in altitude. The Himalayas have many glaciers and snow fields, and in these mountains two of the great rivers of India, the Ganges and the Indus, have their headwaters. Under other names, the same system of mountains extends westward through Afghanistan, Persia, Caucasus, and Asia Minor, and is continued in the southern ranges of Europe. We may, therefore, think of one great line of elevations as reaching from the Pyrenees in western Europe to the southeastern parts of Asia.

North of the Himalayas, occupying all central Asia, is a vast region of plateaus and mountain ranges, of great height. The plateaus of Tibet, Turkestan, and Mongolia are very large. Tibet and Pamir have an altitude of more than 15,000 feet, or about three miles. Because the Pamir Plateau is so high, it is sometimes called "the roof of the world." Rising above the plateaus are many ranges of high mountains. They run in a general east and west direction, and are thus roughly parallel to the Himalayas. Among them are the Hindu Kush, Kuenlun, Tien Shan, and Altai ranges.

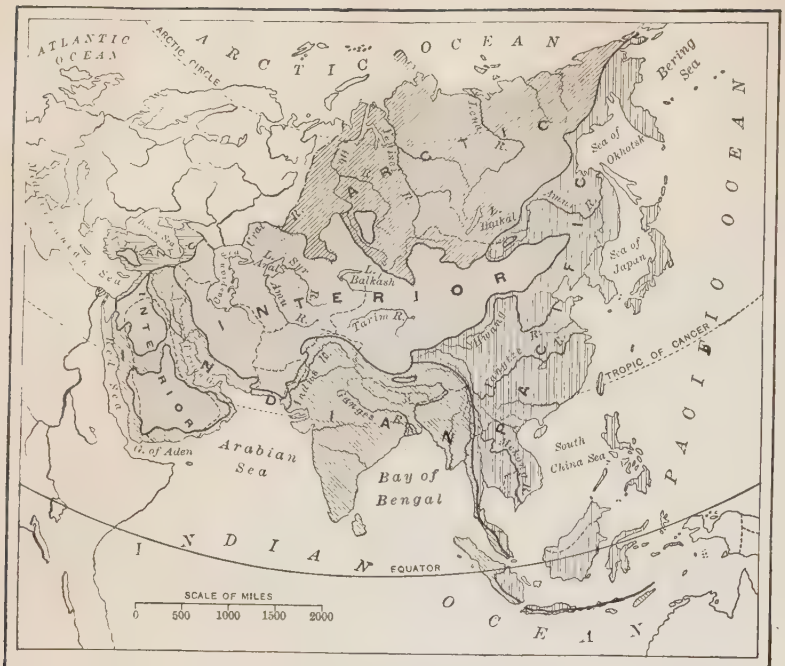

Fig. 491. Drainage basins of Asia

Out of the eastern parts of the central highland flow the headwaters of the Yangtze, the Hwang, and the Amur rivers. On the north slopes of the central highland the rivers of Siberia have their sources. They flow across the vast Siberian plains and enter the Arctic Ocean. They are navigable, but are not of much value for this purpose, because the Arctic Ocean is generally covered with ice, and is far from the commercial countries. The rivers also are so long from south to north that their northern courses are often frozen when the southern parts are open. This results in ice blockades and causes great floods. The rivers of China and of southern Asia are important for commerce, because they are large, are open to the sea, and flow through densely populated countries. Name six of them (Fig. 488).

The surface, climate, and drainage of Asia are such that the most people and the greatest trade must always be within 500 or at most 1000 miles of its borders. The shore line of Asia is irregular, though not so irregular as that of Europe. Some parts of the peninsulas of eastern and southern Asia are mountainous. These regions have many volcanoes and are shaken by violent earthquakes.

✶ **496. Climate.**—Asia lies in the same zones as the continent of North America. The northern part of Siberia is intensely cold in winter, and the region where the Lena River crosses the Arctic Circle is one of the coldest places known in the world, having an average temperature in January of 60° below zero. The southern part of the Siberian plain has a cold-temperate climate, somewhat like that along the boundary between our western states and the Dominion of Canada. As the westerly winds first cross Europe and then pass for thousands of miles over the long stretches of Siberia, all the moderating effect of the Atlantic Ocean is lost. The climate of central Asia is continental: the summers are warm, and the winters are bitterly cold.

We have already learned that Russia in Europe, on its southeast border, is a steppe. The dry grasslands continue eastward over Turkestan and among the high plateaus of central Asia. Little moisture can come from the Atlantic or the Indian Ocean, and the central and west-central parts of Asia are mainly desert (Fig. 367).

The countries of southwestern Asia are largely desert because they are in the belt of the northeast trades, and these winds have moved for long distances across the inland parts of the continent. They have, therefore, gathered but little moisture, and they descend into the warmer lands of southwestern Asia as drying winds. They continue across Egypt and the Sahara in the same condition. Hence we find a desert stretching from

eastern central Asia across Asia and Africa to the Atlantic Ocean. This is by far the greatest desert area in the world. We know from the historical books of the Bible and from other ancient and modern writings that in all this region springs, wells, and rivers have always had the greatest value, in the raising of crops and in the locating of homes and routes of travel (Fig. 492).

Fig. 492. A well at Nazareth, in Palestine

The northern part of Asia is cold, and the central and western parts are dry; but the southeastern parts are wet and hot, and they contain about four fifths of the population of the continent. Southeastern Asia has about 700,000,000 people, and is far more densely populated than any other region of equal area in the world. This is due partly to its great and fertile plains, partly to climate, and partly to ample facilities for trade.

The climate is warm in the southern lowlands, because they are south of the Tropic of Cancer; and in eastern China the climate is tempered from the neighboring ocean. The rainfall of southern Asia (Fig. 493) is brought chiefly by the summer monsoons (Sec. 373).

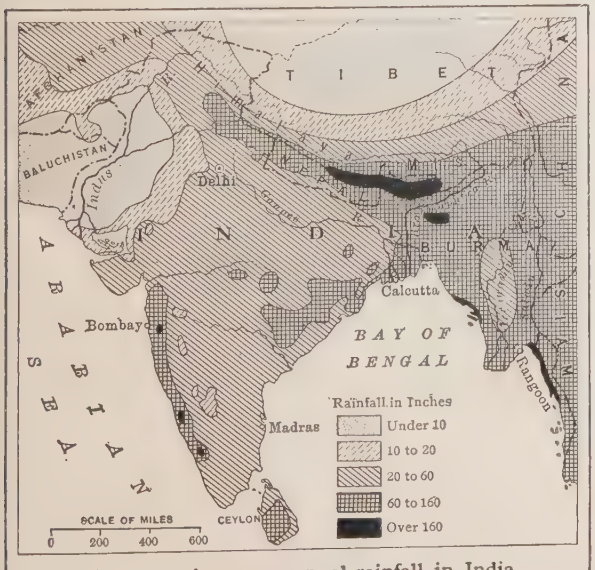

Fig. 493. Average annual rainfall in India

PLANTS AND ANIMALS

497. Vegetation.—Along the Arctic border the plains are tundras, frozen in winter, and thawing to a depth of a few feet during the short summer. Only grasses and other small plants flourish there. Southward there are heat and moisture enough for a belt of forest, in which evergreen trees, larches, and birches are common. South of the forest the dry region begins, first the steppes and then the mountains and plateaus, which are too high, dry, and cold for much vegetation. In southwestern Asia, wherever there is sufficient rain, or wherever irrigation is used, the vegetation, like that of southern Europe, is subtropical. In India, Indo-China, and the East Indies is the truly tropical country, with rank forests, dense jungles, and fields that produce several crops a year, because growth takes place throughout the twelve months.

498. Animals.—Most kinds of animals can move from one region to another while plants cannot, but still animals depend on climate, for they become accustomed to certain temperatures and suitable kinds of vegetable food. Thus we find that the reindeer is the important animal in northern Siberia. In winter it lives upon the mosses of the tun-

Fig. 494. Tiger

dra, which it reaches by pawing away the snow. In the forest belt are fur-bearing animals, — otter, beaver, sable, ermine, — whose pelts are taken to the fur markets of Russia, to the German fur center, Leipzig, and to other countries and cities. In the arid parts of Asia, sheep, goats, cattle, and horses are kept by the wandering tribes. In these regions the camel is one of the important beasts of burden, because of its ability to live for days without water.

In India elephants are found wild in the jungle, and are also domesticated and used to carry people, to haul heavy loads of merchandise, and even to pile timber. Lions, tigers, apes, and monkeys are found in the jungles, and crocodiles and numerous serpents live in the waters and the forests. Insects of all kinds abound, and some, as, for instance, certain species of ants, are very destructive. Boring worms destroy timber, and the people have to take many precautions to preserve health and property. The tropical belt, especially in the East Indies, has many birds of brilliant plumage.

Review.—1. How does the general surface of Asia differ from that of Europe, or of North America? 2. Give the name, altitude, and location of the highest mountain peak. 3. What is the height of the central plateaus? 4. Why are the Siberian rivers of small commercial value?

5. Describe the climate of Siberia; of western Asia. 6. Why is central Asia arid? Southwestern Asia? 7. What regions are included in the greatest desert of the world? 8. Where do most of the people of Asia live? 9. What are the monsoon winds? 10. What effect do they have on the climate of India and other parts of southern Asia? 11. Where is the heaviest rainfall in the world?

12. What kind of country is northern Siberia? 13. Where is the temperate forest area of Asia? 14. What are some of the domestic animals of Asia? 15. Name some of the important animals of tropical Asia.

PEOPLE AND INDUSTRIES

499. Races.—The majority of the inhabitants of Asia are *Mongolians*, and because of the color of their skin they are said to belong to the yellow race of mankind. To this race belong the Chinese, the Japanese, the people of the Indo-Chinese peninsula, and many of the people of the East Indies. Among the Mongolians who have settled in Europe are the Finns and others in the north, the Magyars

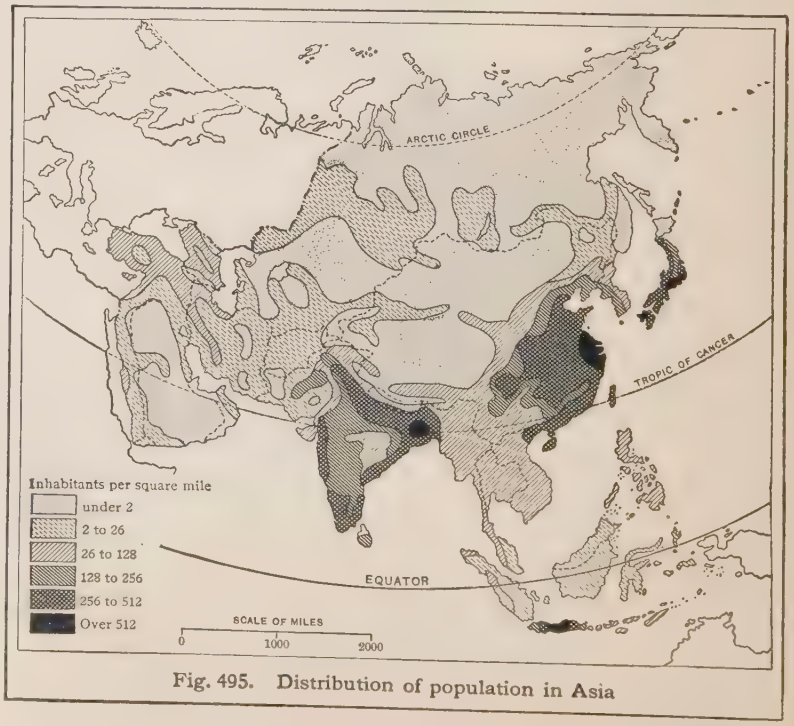

Fig. 495. Distribution of population in Asia

of Hungary, and the Turks of the Balkan Peninsula. The people of the yellow race are short and have black hair, high cheek bones, and narrow, oblique eyes; the men have scanty beards.

Many of the people of Asia are *Caucasians*, but this race is more numerous and more scattered in all parts of the world than the Mongolian race. We see, every day, that some members of the white race are light in the color of eyes, skin, and hair. We call these blondes. Others are dark in skin, eyes, and hair, and are called brunettes. These differences are found especially in America and between northern and southern Europe. The French, Spaniards, and Italians are usually dark. There are many million people in Asia belonging to the so-called white race, but they are usually of the dark kind, and some of them are almost as dark as negroes. People that have lived, as their ancestors have lived, for thousands of years under a hot sun, are darker than people whose ancestors have lived in a cooler climate, and under a dull sky, as in northern Europe.

Among the people of the white race are most of the inhabitants of India and a large part of the population of Asiatic Russia, Persia, Arabia, and neighboring lands. The Semitic people are white; the Jews and Arabs are branches of this people, as were also the ancient Babylonians and Assyrians of Mesopotamia.

In small parts of southeastern Asia are some groups of the black or *negro* race. In the northeast, near Bering Strait, are a few Eskimos, who, according to some scholars, belong to the red or *Indian* race.

500. Religion.—There are several kinds of religious belief in Asia. They all had their beginnings in Asia, and some of them have spread widely over other parts of the world.

Christianity had its origin among the Jewish people, in the life and teachings of Jesus. Christians believe in one God, in Jesus as the Savior of men, and in the Bible as the greatest source of religious and moral teaching. This faith has many followers in western Asia, and is the principal religion of Europe and the New World. It embraces most of the white race, and the most enlightened and progressive countries.

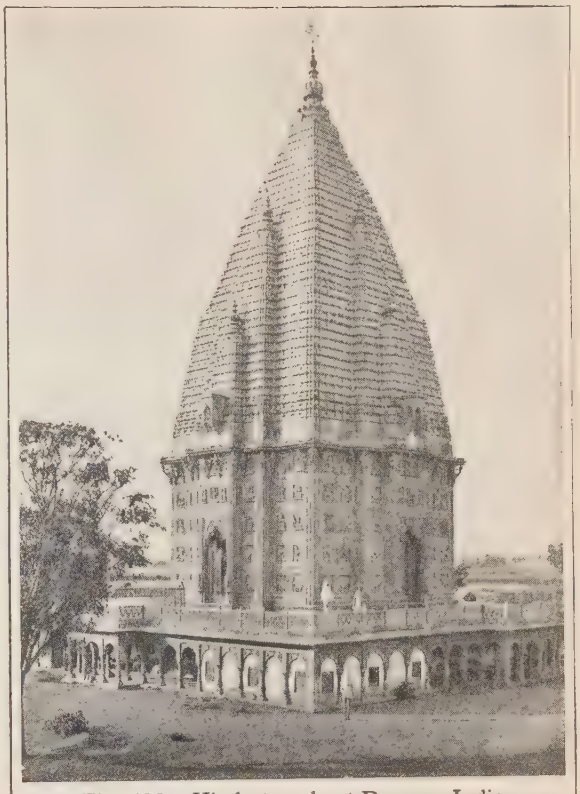

Fig. 496. Hindu temple at Benares, India

Brahmanism is the religion of the Hindus, or most of the people of India. Their name for God, or the Universal Spirit, is Brahma; but they worship many gods. The people are divided into classes or castes, and the members of one caste will have nothing to do with members of another. People of the lowest class are considered as outcasts. Modern government and schools and the teachings of missionaries are slowly breaking down the cruel caste system.

Buddhism was founded on the teachings of an ancient prince in northern India who was given the title of Buddha. He rejected the idea of castes and taught a life of purity

and kindness. His followers are Buddhists. They are not numerous in his native country, but are counted by hundreds of millions in other countries, mainly in China, Japan, and Indo-China.

The Chinese are devoted to the worship of their ancestors, and nearly all — whether Buddhists or not — accept the moral teachings of Confucius, who lived and taught at the end of the sixth and the beginning of the fifth century before Christ.

Mohammedanism is the religion founded by Mohammed, a religious teacher who lived in Arabia about six hundred years after Christ. His followers are called Mohammedans. Their creed is, "there is one God, and Mohammed is his prophet." Their sacred book is the Koran. In past centuries they often compelled people by the sword to accept their faith, and they are numerous in southwestern Asia, India, and north Africa. At one time they conquered much of Spain (Sec. 458). Their sacred city is Mekka, and a railroad is being extended from the north to that city, chiefly to accommodate Mohammedan pilgrims.

The *Hebrews* of the present day receive their faith from the ancient Jewish people. They believe in one God, and accept the Old Testament as their Bible. They reject the New Testament as not being a part of the Bible, and do not believe that Jesus was the Messiah or Savior. They have been much persecuted and are now widely scattered among the countries of Europe and America.

In addition to the forms of religion already described, many savages and rude tribes in various parts of the world scarcely have a religion, and are called *pagans*. They believe in many gods, or good and evil spirits, and worship images or idols.

Fig. 497. A nomad family, Persia

501. Agriculture.—Agriculture in Asia goes back to times so ancient that we have no record of its beginnings. No one knows when the chief grains and fruits were improved from wild plants, and no one knows when or where cattle, horses, dogs, camels, and other animals were domesticated and made to serve man.

More of the people of Asia are engaged in cultivating the soil than in any other occupation. This is especially true in eastern and southeastern Asia, where the climate is warm and rain plentiful. It is because of these conditions that so many people can live in those parts of Asia. Nearly half the human race live on the warm and fertile side of this one continent. They are overcrowded there, and when a crop fails or is short, famine follows and thousands die of starvation.

In the central, northern, and western parts of Asia the country is generally too cold or too dry for agriculture. Near springs of water and along streams, the water has been used for centuries to irrigate the fields, and some crops are raised. A place in the desert that is naturally or artificially watered and made green and fruitful is called an *oasis*. At such a place a village usually grows up, and here caravans stop on their journeys across the desert.

502. Nomadic Peoples.—Many of the people do not try to live by agriculture, but wander from place to place. They are called *nomads*, and they look down on farmers as inferior people.

The natives of northern Siberia live in the far north only in the short summer. The reindeer is their beast of burden and is useful for its milk, its hide, and its bones, which are used for making tools. In summer the natives gather wild berries, and catch fish for summer food and to dry for winter use. In the winter they move southward into the edge of the Siberian forests. They live in rude tents, and the women stay at home and prepare the food, make the clothing out of skins, and care for the animals. The men go out in the forest and hunt for animals that yield furs. When summer comes they go back again to the tundra.

Fig. 498. Stamping the pattern on cloth in India

The people of the deserts and steppes also are nomads. They have many horses, camels, cattle, and sheep. These require pasture, and as grass is scattered or in patches, the family must move, sometimes every day, sometimes at greater intervals, depending on how long the pasturage holds out. Not only one family, but the sons and their families, and the servants as well, stay together, and thus the family becomes a tribe. The men of the steppe are expert horsemen from childhood, and wealth consists in owning many horses and other animals. Here, as in the tundra, the women do most of the drudgery of the camp. The customs of these people make them independent and brave. Many pictures of life such as theirs are found in the historical books and poems of the Old Testament. The desert people do not change their habits, and we find them to-day living much as they lived in the days of Abraham.

503. Fishing.—Among the tribes in the northern and northeastern parts of the continent, fishing and hunting furnish a large part of the food. Fishing is also an important industry among the Japanese and Chinese.

504. Mining and Manufactures.—The mineral wealth of Asia is enormous, but only a small part of the mineral riches of the continent have been worked in any systematic way.

Manufactures are not so extensive or so greatly varied in Asia as they are in Europe or North America, for the people are not so progressive. They have never invented fine machinery, and their chief products are made by hand and in their homes. Nevertheless, many of them are skillful and show much taste in making objects of beautiful forms and colors. The Chinese and Japanese make silks and pottery that win the admiration of the world, and the people of the drier lands of western Asia have for hundreds of years made the finest and rarest rugs and carpets. These are woven on hand looms, and months and sometimes years are spent on a single piece. The fibers are from the wool and hair of sheep, goats, and other animals, and are colored with dyes made from plants. In recent years these rugs have been much sought by people in Europe and America, and the demand has led to the building of factories and to the making of many rugs of poorer quality.

505. Ancient Routes of Trade.—Long before the time of Christ the Asiatic peoples traded with one another. They followed well-beaten trails, and their caravans went between China and India on the east, across the plateaus and over the mountain passes to Persia, to the regions along the Euphrates, and to the shores of the Mediterranean. It was also before the Christian era that the people of Europe began to want the tea,

the fabrics, the jewels, and the spices of the East. Much of this trade was carried on by the Phœnicians, who lived in Tyre and Sidon, ancient cities at the east end of the Mediterranean Sea. They received the goods from the caravans and took them westward in their ships. After a time the Roman people controlled the trade, and later the citizens of Venice and Genoa, great commercial cities of Italy, were the chief traders. About the time America was discovered, a way was found to the East around the Cape of Good Hope, and the land routes of Asia became of less importance. Many of them, however, are still used.

506. The Awakening of Asia.—Most of the people of Asia have been satisfied to do the same things in the same ways for thousands of years. This is shown in the worship of ancestors in China, the caste system of India, and the ways of life in the desert. But many changes are now taking place. Foreign nations have pressed into Asia for conquest, for commerce, and for missionary work.

Many years ago the Japanese opened some of their ports to foreign trade. Gradually China has pursued the same course. Great Britain founded a great commercial city on the island of Hongkong just off the shores of China. The British have also for a long time ruled the three hundred million people of India. They have built railroads, founded schools, introduced machinery, and developed agriculture. The Russians have extended their control over northern Asia, and have built several railroads. Japan is one of the most progressive nations, and China is building railroads and modern factories.

Indian, Chinese, and Japanese young men and women study in the schools of Europe and America. Some of them have been sent by their governments to learn the ways of the West so that they may introduce them into the Orient. In southwestern Asia, rapid changes are resulting from the World War. The ending of Turkish misrule made it possible for Syria, Palestine, and other lands to progress in agriculture, manufacturing, commerce, and education. The entire continent is rapidly advancing and taking its place as a part of the modern world.

Review.—1. Give an account of the distribution of the yellow race. 2. Where, in Asia, are people of the white race found?

3. Name and briefly describe each of the chief forms of religion in Asia. 4. What is a pagan?

5. In what part of Asia is agriculture chiefly pursued? 6. Describe the life of the northern nomads; of the desert nomads. 7. Name some of the chief articles manufactured by Asiatic people. 8. Give an account of the Phœnicians. 9. What changes show that Asia is becoming more modern and enlightened?

Fig. 499. School in Persia

Fig. 500. Railroad station, Bombay

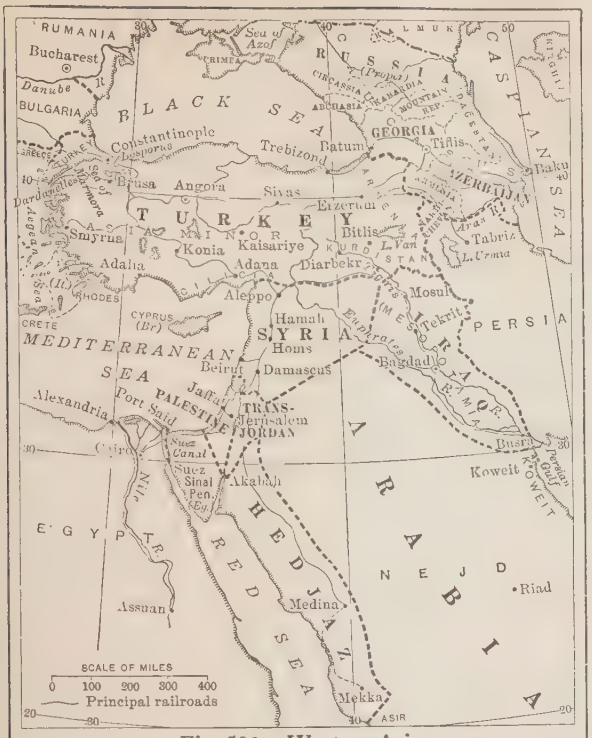

Fig. 501. Western Asia

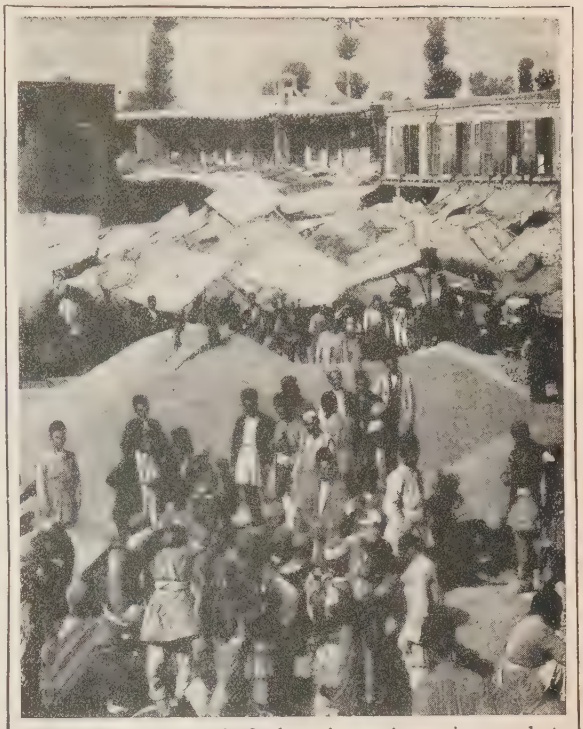

Fig. 502. A mound of wheat in an Armenian market

THE COUNTRIES OF SOUTH-WESTERN ASIA

507. Turkey.—The westernmost country of Asia is Turkey. It occupies Asia Minor, the peninsula that has the Black Sea on the north, the Aegean Sea on the west, and the Mediterranean Sea on the south. It is a rugged plateau bordered by ranges of mountains on the north and south.

Centuries of misrule have kept the people in ignorance and poverty. Turkish industry, therefore, is very primitive. Cereals, tobacco, cotton, fruits, and nuts are, with wool and mohair, the principal products. The country is rich in petroleum and minerals, and the fisheries are important. Textile manufactures are increasing.

Angora is the capital. The chief seaport is Smyrna. Trebizond has long been the starting point of caravans going to Persia.

Northeastern Turkey includes most of Armenia, which for a short time after the World War was an independent country. It is a mountainous land where the chief industries are farming and grazing. The Armenians are of the white race and hold the Christian faith. For a long time they have been bitterly persecuted by the Turks and by savage tribesmen known as Kurds. The small part of Armenia that is not in Turkey is a republic under the control of Russia.

508. Syria and Palestine.—Syria lies east of the Mediterranean Sea. In Syria, north of Palestine, is the Lebanon mountain range, still bearing such giant cedars as are mentioned in the Bible. Aleppo is a commercial center in northern Syria. Damascus, in an oasis, is the chief city of the country. In the World War, French forces occupied the Syrian coast, and after the war Syria was made a French protectorate.

Near Syria is the large island of Cyprus. It was occupied by the Phœnicians three thousand years ago. It has since had many rulers, but is now governed by Great Britain.

Fig. 503
PALESTINE
Scale of Statute Miles
0 5 10 20
12 MILES TO ONE INCH
Main Highways:
Railroads in operation:
Proposed Railroads:
ELEVATIONS IN FEET
OVER 3000
2000 TO 3000
1000 TO 2000
500 TO 1000
SEA LEVEL TO 500
BELOW MEDITERRANEAN SEA
All place names are Biblical or Historical except those in parenthesis (Acre), which are Modern place names.
Longitude East from Greenwich
34°30′
35°
35°30′
36°
33°
32°30′
32°
31°30′
31°
MEDITERRANEAN SEA
DEAD SEA
(The Salt Sea)
1292 feet below the Mediterranean
Helcph
Kedesh Naphtali
Ladder of Tyrus
Iron
Waters of Merom
Abdon, Hebron
Achzib
Zebulun
Dabbasheth
Mishal or Misheal
Beth Emek
Accho
Ptolemais
(Acre) (Akka)
Achshaph
Ramah
Chorazin
Bethsaida Julias
Capernaum
Bethsaida
Beth Dagon
Cabul
Ras el Kerum
Bay of Acre
Shikmonah
(Haifa)
Magdala
Sea of Galilee
(Lake of Gennesaret)
632.5 feet below Med. Sea
Plain of
Asochis
Rumah
Toran
Tiberias
Gamala
Kittron
Cana of Galilee
Tarichaea
Haresheth
Mt. Carmel
Shimron
Nazareth
Maralah
Mt. Tabor
1843
Zaphon
Gadara
(Mezerib)
Nain
Endor
Little Hermon
Abila
Dor
R. ed Dufleh
Tell el Mutasellim
Megiddo
Afulah
Shunem
Capitolias
Kamon
Ramath Mizpeh
Arbela
Well of Harod
Ford of Abara
(Bethabara)
Caesarea
Taanach
Bethshean
(Scythopolis)
Pella
Enganim
(Jenin)
Mt. Gilboa
Jabesh Gilead
Dothan
R. Iskanderuneh
Jarmuth Ramoth
Sanur
Bethulia
Mt. Kafkafa
Geba
Thebez
Tirzah
Mizpeh
Pirathon
Samaria
Ænon
Tulluza
Ramoth Gilead
Gerasa
Mt. Ebal
Mt. Kukarit
Shechem
(Nablous)
Mt. Gerizim
Salim
Joseph's Tomb
Jacob's Well
Apollonia
Mt. Mastubeh
Tiphsah
Gibeah
Ekrebel
Antipatris
Mount of Gaash
Gilead
Joppa
(Jaffa)
Jehud
Mount Ephraim
Lebonah
Shiloh
Adam
Mt. Gilead
Jogbehah
Gath Rimmon
Ed
(es Salt)
Philadelphia
(Ammon)
Rabbath
Lydda
Gibbethon
Modin
Bethel
Gimzo
Beth-Horon Lower
Berea
Rock Oreb
Jabneel
Ekron
Beth-Horon Upper
Jericho
Gezer
Ajalon
Gibeon
Ramah
Cedron
Emmaus
Mizpeh
Beth Hoglah
Heshbon
Beth-Haram
Ford of Hajlah
Zorah
Eshtaol
Chesalon
En-Shemesh
Beth-Jeshimoth
Azotus
Mekonah
Jerusalem
Mt. Pisgah
Mt. Nebo
Shaphir
Bittir
Rachels Tomb
Mar Saba
Gath
Bethlehem
Field of the Shepherds
Medeba
Midgal-Gad
Ascalon
Meronoth
Mt. Peor
Takoa
Wilderness of Tekoa
Eglon
Eleutheropolis
Maarath
Callirhoe
Ataroth
Mareshah
Halhul
Kiriathaim
Cabbon
Beth-Zur
Machaerus
Lachish
Dannah
Hebron
Beth-Gamul
Gaza
Etam
Dibon
Aroer
Hill of Hachilah
En Gedi
Gerar
Debir
Sharuhen
Mt. Ghweitheh
Madmannah
Zanoah
Jattir
Middin
Mt. Shihan
Masada
Ar. of Moab
Kh. Hora
Jeshua
Beersheba
Sheba
Adadah
Mt. Tarfuyeh
Kir of Moab
I D U M E A
Mt. Usdum
Val. of Salt
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In the World War Palestine, the "Holy Land," was wrested from the Turk after centuries of corrupt rule. Many Jews plan to go there to set up a new Zionist Republic, under British protection.

Palestine is a small country, but is of great interest because here the most important events of Hebrew history took place. Here Jesus lived, and the Christian church was founded. On the Mediterranean side is a coastal plain, the land of the ancient Philistines. Here is Jaffa, the seaport of Jerusalem. Back of the plain is a range of low limestone mountains. On the top of this range is Jerusalem, the Holy City (Fig. 504), and a few miles south is Bethlehem, the birthplace of Jesus.

Fig. 504. Jerusalem. The large dome at the far left is on the Church of the Holy Sepulcher

East of this ridge is the deep valley of the Jordan and the Dead Sea. The Jordan rises in a great spring south of Mount Hermon, flows through the Sea of Galilee and down to the Dead Sea. This latter sea is in so hot a region, and the rainfall is so small, that it has no outlet and is a salt lake. Its surface is 1292 feet below sea level, and it is so salt that no fish can live in it. The southern part of Palestine was the ancient Judea, and the northern part was Galilee, containing Nazareth, the home of Jesus.

Palestine is called in the Old Testament a land flowing with milk and honey, but this statement is far from being true now. Since those early days the country has been sadly neglected, its trees have been cut away, and the soil has been washed from the hillsides. At the present time it is beginning to prosper again under modern enterprise.

A railroad extends from Jaffa to Jerusalem. Another runs from Damascus to the sea at Beirut, and a long line, nearly completed, extends from Smyrna to Damascus, and far southward. It will be continued to the outskirts of Mekka, the sacred city of the Mohammedans. Another railroad is planned to cross Syria and Mesopotamia from the Mediterranean Sea to the Persian Gulf.

509. Iraq and Arabia.—Iraq, also called Mesopotamia ("between the rivers"), is the region of lowland along the Tigris and Euphrates rivers. It was the seat of ancient empires and of the cities of Nineveh and Babylon. Here, as in Egypt, irrigation was practiced in ancient times and its use is again increasing with the revival of agriculture. One of the chief resources is petroleum, of which large amounts are obtained. Bagdad is the principal city. Goods and passengers are carried on the rivers by rafts and steamboats.

Iraq is an Arab kingdom under the protection of Great Britain.

Arabia is an immense peninsula, one third the size of the United States. It is widest at the south, and is bordered on the west by the Red Sea, on the south by the Arabian Sea, and on the east by the Persian Gulf. It is mainly a high plateau with a very dry climate. Much of it has never been explored.

The kingdom of Hedjaz, with British aid, threw off the Turkish yoke in 1916. This small country on the eastern shore of the Red Sea contains the important Mohammedan cities of Mekka and Medina, and aims to become the nucleus of a greater Arabia.

Asir and Yemen, former Turkish provinces southward from Hedjaz, are small agricultural states. Yemen exports coffee.

Fig. 505. Plowing in Persia. The plow is drawn by eight buffaloes

Aden, at the southwest end of the peninsula, is owned by Great Britain and is an important coaling station.

Oman is an independent state. Its seaport is Maskat, from which many dates are sent to the United States. In the Persian Gulf are important pearl fisheries.

The interior of Arabia has no single government. Its wandering Arab inhabitants are called Bedouins, and the tribes are under native chiefs called sheiks. The people are few, and only small districts can be cultivated.

The Red Sea on the one side, and the Persian Gulf on the other, were important routes of commerce in ancient times, and since the Suez Canal was constructed the Red Sea has again become a great trade route.

510. Persia.—Persia is an ancient country, and many centuries ago it was very large, reaching from the Mediterranean Sea to India. It is now a country nearly three times as large as France, but has less than one fourth as many people. So much of it is desert or barren mountain side that food for a large population cannot be raised. Much more of everything could be produced, however, if the people had the skill and the machinery that are common in Europe and America. Figure 505 shows the clumsy Persian method of plowing.

The surface of Persia is a plateau with many mountains and valleys. Over much of the area the rainfall averages only about five inches a year. There are few rivers and many deserts. The streams usually disappear in the desert sands. The snow and rain of the mountains supply such streams as the country has, and the water is used in the valleys for irrigation. The northern part of the country, around the Caspian Sea, has a more moist climate and considerable forest, but it is unhealthful. Silk, wool, cotton, tobacco, wheat, and barley are common products of Persia, as are fruits and gums.

Many sheep and cattle are raised. Much of the wool is used in making beautiful rugs and shawls. They are among the finest of those produced in Asia. The rugs (Fig. 500) are known by the name of the city or province in which they were made, each district having had for hundreds of years its favorite colors and designs. Many of these rugs are sold in America.

The mineral wealth of Persia is undeveloped, but there is evidence that the country is rich in petroleum. Many borings have

Fig. 506. A rug being made by hand in Persia

already been made and oil is being shipped in increasing quantities.

Nearly all the Persians are Mohammedans in faith. The greater number lead a settled life in towns and cities, but there are many tribes of nomads or wanderers (Fig. 497).

In 1906 a constitution was granted to the people by the Shah, as the ruler is called, and a government was organized to meet the desires of the more intelligent Persians.

The cities have fine mosques and some beautiful shops (Fig. 507). The houses are usually made of dried mud and the windows face an inner court, leaving the street blank and unattractive. Teheran, the capital and largest city, has made much progress. Ispahan was formerly the capital.

By the Persian Gulf the country communicates with Bombay and other ports of India. On the west, caravan routes lead to the Black and Mediterranean seas. On the north, the Russians have built a railroad to the boundary. The roads in Persia are poor. Travel has always been by means of animals, but recently automobiles have been introduced.

511. Afghanistan.—Afghanistan lies between Persia and India. It is nearly as large as the state of Texas, or the Canadian province of Saskatchewan. There are about six million people. The ruler is called the Ameer.

Most of the country is mountainous. In the fertile plains and valleys grain and many varieties of fruit are grown in abundance. Preserved fruits are exported.

Review.—1. Describe the surface of Palestine. 2. Give an account of the Jordan and the Dead Sea. 3. Locate Jerusalem, Bethlehem, and Jaffa. 4. What changes have taken place in Palestine? 5. What country governs Cyprus? 6. Where is Iraq? Syria? Armenia? Turkey?

7. Give an account of Hedjaz and its capital. 8. Where are Oman and Aden?

9. What is the ruler of Persia called? 10. Compare Persia with France as to size and population. 11. How do the Persian rugs compare with those made in other parts of Asia? Where are many of them sold? 12. What is the condition of transportation in Persia?

13. Describe Afghanistan.

Fig. 507. Mosque in a Persian city

Fig. 508
Physical and Political
INDIA AND INDO-CHINA
Scale of Statute Miles
0 50 100 200 300 400 500
353 MILES TO ONE INCH
Capitals: ⊙ Railroads:
ELEVATIONS IN FEET
OVER 15000
5000 TO 15000
2000 TO 5000
1000 TO 2000
500 TO 1000
SEA LEVEL TO 500
Plateau of Tibet
Himalaya Mts.
Arabian Sea
Bay of Bengal
INDIAN OCEAN
Bombay
Calcutta
Madras
Bangalore
Hyderabad
Karachi
Lahore
Delhi
Kabul
Rangoon
Bangkok
Saigon
Hanoi
Colombo
CEYLON
Port Blair
Georgetown
Longitude East from Greenwich
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INDIA

512. Size.—India proper occupies the central peninsula of southern Asia, together with large regions to the north. Bordering it on the west is the desert country of Baluchistan. The Indian Empire under British control includes India proper and Baluchistan, and also Burma, which extends over the west side of the Indo-Chinese peninsula. The total area of this greater India is only three fifths that of the United States, but it contains more than 300,000,000 people. Besides the Hindus, there are in India many different peoples speaking various languages.

513. Surface.—The surface of India may be divided into three main parts,—mountain, lowland, and plateau.

The first region is the southern portion of the Himalaya Mountains. Even the passes over these mountain ranges are from 16,000 to 19,000 feet above the sea, or higher than the highest peaks of the Alps. Here are the sources of the two principal rivers of India, the Ganges and the Indus. The Indus flows southwest and enters the head of the Arabian Sea. The Ganges receives many rivers from the mountains, flows southeast, and enters the Bay of Bengal. Near its mouth it is joined by the Brahmaputra, which is 1800 miles long, or longer than the Ganges itself. This river comes from Tibet, north of the Himalayas. The combined rivers have built a very large delta.

The second region consists of the lowlands of both the Indus and the Ganges. These rivers and their tributaries have spread out the waste from the mountains into wide flood plains, which make up the lowland of India, extending from the Arabian Sea across to the Bay of Bengal. Except some desert ground near the Indus, this plain is densely populated and has many cities.

The third region is the central and southern part of the peninsula, which is a plateau called the Dekkan. Much of this upland is a half mile above the sea, and the larger part of it is covered by ancient lavas, which in some places are more than a mile thick. The surface long ago weathered into soil. There are many mountains in the Dekkan.

The coast line of India is little broken, and there are but few good harbors.

514. Irrigation.—The lower Ganges flows through a region of heavy rains (Sec. 373). During the summer monsoons the western coast of India from Bombay southward is well watered. The winter monsoons give rain in Ceylon and the adjacent parts of the mainland coast. But much of India is so dry, at least a part of the year, that irrigation is needed. The natives dug irrigation canals centuries ago, but the British people have greatly extended irrigation, and have made India the first country in the world in this respect. In years of serious drought, however, the people of a large part of India are in danger of starvation. There has been much loss of life in this way, in spite of help from the government and of gifts of private charity from other lands.

Fig. 509. Shore of the Ganges River at Benares

515. Agriculture.—The three principal grains raised in India are wheat, millet, and rice. Wheat is raised in the lowlands of the northwest, also in the Dekkan Plateau, and some of the crop is exported. Much of it is taken to Karachi, near the mouth of the Indus, and much goes to Bombay, and is there made into flour. Most of the people are too poor to eat wheat bread, and many use millet. In the lowlands of the lower Ganges, where the fields can be easily flooded, is one of the great rice regions of the world. Two crops a year are usually raised. Not much of the rice that we buy comes from this part of India, for most of the crops there are needed at home. Burma exports more rice than any other region. One third of the people of the globe—including many of the people of India and China—find in rice their chief food.

Fig. 510. A banyan tree

Much cotton is raised in the central parts of India. Some of it is sent to English factories and some is spun and woven in the cotton mills of India. Jute, a tall plant, yields a silky fiber used in adulterating fine woven goods of many kinds, as well as in making ropes and bagging. Silk is produced, but not so extensively as in China. Cinnamon and pepper are among the spices raised in India. Sugar cane and oil seeds, including flax, are important crops.

Tea is one of the chief products. It is grown especially in the lower valley of the Brahmaputra. Much tea is exported from this part of India.

516. Lumbering and Other Industries.—Teak is a hard and durable wood that grows in several parts of India and is valuable for shipbuilding and for furniture. It is not usually attacked by the insects that destroy softer woods. Some teak trees are 200 feet high. They are generally girdled, and killed, two years before they are cut, so that the wood may season while standing. Teak leaves furnish a purple dye for silk and cotton goods. The bamboo (Fig. 530) is used for many implements and in the construction of the light, simple houses of the natives. The banyan is a curious, spreading tree with many trunks (Fig. 510). Palms and coconut trees furnish drink and food.

Many cattle are raised, but chiefly for domestic use. Hides and skins, however, are exported in large numbers.

The mineral deposits are valuable and include coal, iron, petroleum, and gold.

517. Government.—Three hundred years ago Great Britain, France, and Portugal began to trade with India, and the British after a time gained control of nearly all the country. Many native states still have their own governments, under British influence, but since 1858 most of the land has been directly under British rule. The king of Great Britain now has the title emperor of India, and the British government appoints a viceroy who is the actual ruler. In 1912 the capital was removed from Calcutta to Delhi, the ancient capital of a former native empire.

It is the policy of the government to give the natives a gradually increasing share in the management of affairs. Much has been done for India by British rule. Irrigation has been extended, better and cleaner ways of living promoted, schools supported, and more than 30,000 miles of railroad have been built. Before 1858 there were less than 1000 post-offices, while now there are about 20,000.

Fig. 511. Bombay, India

518. Cities.—Calcutta is the largest city of India, with about 1,300,000 people. It is on the delta of the Ganges and is a great commercial city in spite of its poor harbor. Bombay (Fig. 511) is the second city. Since it has been possible for ships to come from Europe to Asia by the Mediterranean Sea, the Suez Canal, and the Red Sea, Bombay has become an important seaport. Madras is a port in southern India. Hyderabad is the largest city of the interior. Benares is on the Ganges (Fig. 509), and both the river and the city are regarded as holy by the Hindu people. They believe that they receive blessing by drinking or bathing in the water of the river, or by making pilgrimages to the city.

519. Burma.—Burma is a large province with more than 13,000,000 people of various races. Only a small part of the country is under cultivation, but under British control conditions are improving. Rangoon is the largest city and chief seaport (Fig. 512). It exports much teakwood and rice. Mandalay is the chief city of the interior. On what river is it (Fig. 508)?

Fig. 512. A street in Rangoon, Burma

520. Nepal and Bhutan.—The small countries of Nepal and Bhutan, in the mountains north of India, are called independent; but they are under British protection. Nepal has several million inhabitants. Most of them are people called Gurkhas, and many of the men are soldiers in the British army.

521. Ceylon.—The island of Ceylon has been for a hundred years under British rule. It is a colony by itself, not part of British India. The area and population are nearly as great as those of Ireland. It is one of the three largest tea-raising regions in the world, and raises rubber, coconuts, and other tropical products. Sapphires and other gems are found, and there are pearl fisheries. Much graphite is mined and exported. The main port, Colombo, is one of the great coaling places for ships engaged in Asiatic trade (Fig. 513).

Fig. 513. Port of Colombo, Ceylon

Fig. 514. Rubber plantation near Singapore

SOUTHEASTERN ASIA

522. Indo-China.—The peninsula of Indo-China includes Burma (Sec. 519) and the countries southeast of it.

The Malay Peninsula, narrow and mountainous, stretches far southward from Burma. The southern end of the peninsula is known as the Straits Settlements, because bordered by the Strait of Malakka, which separates the mainland from Sumatra. The Settlements form a British colony, and connected with it are a number of Malay states that are under the protection of the British government. This region produces a great variety of tropical gums, spices, fruits, and grains, but the best-known exports are rubber and tin, of which a large part of the world's supply comes from this region. The barbarous natives have become orderly and somewhat civilized through steady employment in producing tin and rubber.

Singapore, on an island near the end of the peninsula, is a large city founded by the English, and is a very important port, because it is on the route of all ships sailing around the south shore of Asia.

East of Burma are two countries, Siam and French Indo-China. In both of them, mountain ranges run from north to south. The Mekong is a great river on the boundary of the two countries.

Siam is not quite so large as Texas, but has nearly twice as many people. As in India, rice and millet are important crops, and tin, gold, and gems are among the minerals found. Here also teakwood is one of the most valuable products. The government is an absolute monarchy — one of the few still existing. The capital is Bangkok (Fig. 515), a city intersected by the Menam River and by many canals. On these waters thousands of the inhabitants live in floating homes or houseboats.

The French possessions are about as large as Texas, and have nearly four times as many people. The products are like those of other countries of southern Asia, including teakwood, millet and rice, spices, tea, cotton, and silk. Hanoi, the capital of French Indo-China, and Saigon, near the sea, are important cities.

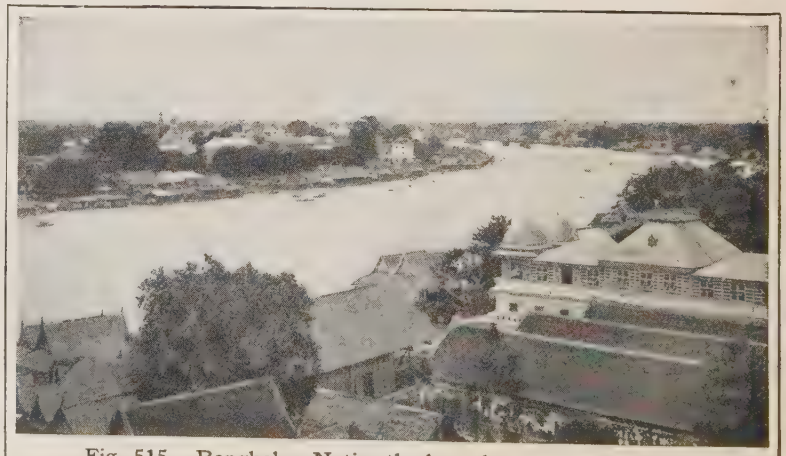

Fig. 515. Bangkok. Notice the houseboats along the shore

Fig. 516. Irrigating rice terraces in Java

523. East Indies.—The East Indies (or Malay Archipelago) are the islands lying between Asia and Australia. All except certain islands that are close to Australia are considered as belonging to Asia. The waters about them are not so deep as in most parts of the ocean. These islands are largely of volcanic origin. Active volcanoes are numerous and earthquakes occur frequently. The vegetable and mineral products are like those of the neighboring parts of the mainland.

More of these islands belong to the Netherlands than to any other country. They are known as the Dutch East Indies. All together they have a surface almost one fourth as large as the United States, and contain nearly 50,000,000 people. The most important of the Dutch possessions, though not the largest, is the island of Java, which has 35,000,000 people, and exports tea, coffee, rice (Fig. 516), sugar, cinchona (quinine), tobacco, rubber, and tin. Most of these commodities are taken to the Netherlands and are then distributed to other countries. Batavia is the capital of Java.

Sumatra is much larger, but has fewer people. It produces tobacco and many tropical products. Near it are two small islands, Banka and Billiton, which have rich tin mines. Borneo is the largest island of the group. It is divided between the Netherlands and Great Britain. The Dutch also hold Celebes, part of New Guinea, and a large number of smaller islands, while the Philippines belong to the United States. All the islands resemble one another in soils and climate, are rich in minerals, and abound in every kind of tropical product.

Review.—1. What regions are included in British India? 2. Where are the principal lowlands of India? 3. Give an account of the Dekkan.

4. Give the chief facts about rice production in India. What other grains are raised? 5. For what is teakwood used?

6. How is India governed? 7. Name the principal cities of India. 8. Name and locate the principal rivers and cities of Burma.

9. What are the products of Ceylon?

10. What name is given to the southern part of the Malay Peninsula? 11. State the location and importance of Singapore. 12. What are the products of Siam? Of French Indo-China?

13. What parts of the East Indies belong to the Netherlands? 14. What localities furnish much tin? 15. How does the population of Java compare with that of the Netherlands?

Fig. 517
Physical and Political
CHINA AND JAPAN
Scale of Statute Miles
0 100 200 300 400 500
505 MILES TO ONE INCH
Capitals: ⊙ Railroads:
ELEVATIONS IN FEET
OVER 15000
5000 TO 15000
2000 TO 5000
1000 TO 2000
500 TO 1000
SEA LEVEL TO 500
BELOW SEA LEVEL
Tropic of Cancer
Longitude East from 120° Greenwich
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SIBERIA
MONGOLIA
OUTER MONGOLIA
INNER MONGOLIA
MANCHURIA
CHINESE TURKESTAN
DESERT OF GOBI
TIBET
CHINESE REPUBLIC
CHOSEN (KOREA)
JAPAN
HONSHU
HOKUSHU
SHIKOKU
KIUSHU
KARAFUTO
SAKHALIN
KAMCHATKA
KURILE ISLANDS
Sea of Okhotsk
Sea of Japan
PACIFIC OCEAN
East China Sea
Yellow Sea
South China Sea
Gulf of Tonkin
Bay of Bengal
Irkutsk
Lake Baikal
Nerchinsk
Chita
Blagovyeshchensk
Khabarovsk
Vladivostok
Petropavlovsk
Semipalatinsk
Kirghiz Steppe
Kiakhta
Maimatchin
Uliasutai
Kobdo
Urga
Algun
Tsitsikar
Harbin
Kirin
Ninguta
Nikolsk
Manui
Dui
Otaru
Sapporo
Hakodate
Aomori
Sendai
Niigata
Tokyo
Yokohama
Nagoya
Kyoto
Osaka
Kanazawa
Fusan
Hiroshima
Fukuoka
Nagasaki
Kagoshima
Seoul
Chemulpo
Gensan
Fusan
Mukden
Newchwang
Antung
Dairen
Port Arthur
Pingyang
Peking
Tientsin
Kalgan
Chengting
Taiyuen
Weihaiwei
Tsingtau
Kiaochow
Tsinan
Kaifung
Singan
Nanking
Chinkiang
Soochow
Hankow
Wuchang
Hanyang
Shanghai
Hangchow
Ningpo
Wuhu
Kiukiang
Changsha
Nanchang
Siangtan
Chungking
Ichang
Chengtu
Batang
Lanchow
Soochow
Kuiyang
Yunnan
Likiang
Tali
Bhamo
Mandalay
Foochow
Amoy
Swatow
Canton
Kowloon
Hongkong
Macao
Wenchow
Changchow
Kuilin
Liuchow
Wuchow
Pakhoi
Kwangchow
Tamsui
Kelung
Tainan
TAIWAN (FORMOSA)
Hanoi
Haiphong
Luang Prabang
Vientiane
Vinh
Phuc
Chiengmai
Prome
Rangoon
Bassein
Moulmein
Bangkok
Bassak
Hue
Lassa
Shigatze
Gartok
Leh
Khotan
Yarkand
Kashgar
Aksu
Kulja
Urumtsi
Turfan
Barkul
Hami
Sairussu
Kuenlun Mts.
Altyn Tagh
Nan Shan
Tien Shan
Himalaya Mts.
Mt. Everest 29,002
Mt. Godwin Austen 28,278
Mt. Kinchinjunga 28,146
Mt. Dhaulagiri 26,826
Mt. Nanga Parbat 26,629
Tsaidam
Koko Nor
Lob Nor
Tengri Nor
Yellow R.
Hwang Ho
Great Wall
Grand Canal
Yangtze R.
Mekong R.
Brahmaputra R.
Ganges R.
Irrawaddy R.
Salween R.
Indus R.
Amur R.
Sungari R.
Ussuri R.
Lena R.
Yenisei R.
Ob R.
Irtish R.
Selenga R.
Kerulen R.
Argun R.
Shilka R.
Tannu Mts.
Great Altai Mts.
Khingan Mts.
Yablonoi Mts.
Stanovoi Mts.
Verkhoyansk Mts.
Kolyma Mts.
Formosa Strait
La Perouse Strait
Tsugaru Strait
Korea Strait
Gulf of Tartary
Gulf of Martaban
Mouths of the Ganges
Calcutta
Darjiling
Patna
Assam
Bhutan
Nepal
Sikkim
Andaman Is.
Philippine Islands (U.S.)
Manila
Luzon
Hainan
Quelpart I.
Shikoku
Kiushu
Honshu
Hokushu
Karafuto
Kurile Islands
Nansei Islands
Okinawa
Lake Balkash
Ili R.
Kara-usu R.
Kirghiz Nor
Durga Nor
Turfan Depression (below sea level)
Taklamakan Desert
Tarim Basin
Kuruk-tagh Mts.
Marussu R.
Salween R.
Tsangpo R.
Irrawaddy R.
Mekong R.
Menam R.
Gulf of Tonkin
Gulf of Martaban
Gulf of Tartary
Sea of Okhotsk
Sea of Japan
Yellow Sea
East China Sea
South China Sea
Bay of Bengal
Pacific Ocean
Tropic of Cancer
Longitude East from 120° Greenwich
90°
100°
110°
120°
130°
140°
150°
160°
70°
80°
50°
40°
30°
20°

CHINA

524. Chinese Provinces.—In addition to China proper, the Chinese government claims authority over four provinces on the west and north: Tibet, Sinkiang, Mongolia, and Manchuria. All together these five regions are about half as large as North America.

Tibet is a high and mountainous plateau. The western part of the plateau is from 14,000 to 16,000 feet above sea level, and surrounding mountains rise much higher. It is very cold and very dry, and yet it contains many lakes. These have no outlets and are therefore salt. The eastern parts of Tibet are lower. The people and the cultivated lands are mainly in the drainage basin of the Brahmaputra River. Barley thrives there, and it is the chief grain and the most important food of the people. The herdsmen keep sheep, goats, and yaks, which can live on the scanty pasturage.

Fig. 518. Yaks

Yaks are much like cattle, but are usually black or white and have coats of long, soft hair. Yak's milk is rich, and is made into curds, which are a favorite food of the Tibetans. Ropes and tent coverings are made of the hair, the flesh is good for food, and the animals are used to carry loads, but not to draw wagons or plows. Thus the yak is as useful in this high, cold region as the reindeer is on the Arctic plains.

Cashmere wool, clipped from goats, is an important export, and brick tea is brought in from China proper.

The Tibetans are so isolated by mountains and so far from the main Chinese nation that they are but little controlled by the central government. Lassa is the capital and is regarded by the people as a sacred city. They try to shut out all foreigners from the place, and only a few have ever succeeded in entering it.

The province of *Sinkiang* includes Chinese Turkestan and other districts northwest of Tibet. It lies largely in the basin of the Tarim River, and is much lower than Tibet. Nearly all the province is a sandy desert, and the river ends its course in a salt lake. There are a few oases, where towns have stood for many hundred years. The most important of these are Yarkand and Kashgar. Through Sinkiang runs an ancient caravan route, by which China has carried on trade with western Asia and Europe.

Between China proper and Siberia is the vast province of *Mongolia.* It is occupied by the Desert of Gobi and by ranges of high mountains. The people are nomadic and devote themselves mainly to the keeping of camels, horses, and sheep. The Chinese call the desert "the Sea of Sand." A great trade route leads from northern China across Mongolia by way of Urga to Siberia.

Manchuria is on the Pacific Coast, east of Mongolia. It has extensive plains, is well watered, has good soil and a favorable climate, and produces large crops of beans and wheat. It has more people than all the three provinces already described. The Russians laid a railroad across it from Siberia to Port Arthur, where they built a great fortress, on ground leased from China. In a war with Russia in 1905, Japan captured this fortress, and these two countries now exercise much influence over Manchuria, though the province is considered as belonging to China. Mukden is the capital. Dairen, the chief port, is under Japanese rule.

Fig. 519. Coolies unloading tea at Hankow

525. China Proper.—China proper is less than half as large as the United States, but has about three times as many people. A complete census is not taken and we do not know the population accurately. The country is mountainous in the west, where it joins Tibet, and in the south, where it borders the Indo-Chinese region. The main lowlands are along the great rivers.

The largest of the rivers is the Yangtze, which to the Chinese is "the great river." It is 3100 miles long and is the main commercial river of China. Ocean vessels ascend to Hankow, 680 miles from the sea (Fig. 519). River steamers go 370 miles farther, and native boats, pulled in some places by means of ropes, by runners on the banks, reach a point 1750 miles from the ocean. Several large cities are on the Yangtze, and the adjoining country has a dense population.

The Hwang is the main river of northern China. Like the Yangtze, it rises in Tibet. After making a great bend northward in Mongolia, it crosses the plains to the Gulf of Pechili. It sometimes rises in terrible floods over these plains, and in 1887 no less than 1,000,000 people thus lost their lives. It is not strange that the people refer to it as "China's sorrow." It has shifted its course as much as 300 miles, and for a time it flowed into the Yellow Sea instead of the Gulf of Pechili.

Much of the interior of northern China is covered with a fine, yellowish soil known as *loess*. This is in places hundreds or even thousands of feet deep. Streams and rains have washed it and cut it into many hilly surfaces. As it is easily dug, and the country is dry, thousands of Chinese families cut out rooms in the banks and cliffs and use them for houses. This material is extensively washed away by the Hwang, or *Yellow* River, so called because discolored by the land waste that it carries.

Fig. 520. Road cut in loess

526. Climate.—The climate of China and its provinces varies greatly in different sections, for the land lies across much of the temperate belt, and its southern parts are south of the Tropic of Cancer. Part of it is low and near the ocean, and the interior is high and far removed from the influence of the sea.

Little moisture can reach the high interior provinces, for most of their area is in the course of the westerly winds, which have moved across Europe and western Asia before they reach the provinces of China. The high wall of the Himalayas shuts off moisture derived from the Indian Ocean.

China proper and Manchuria have much more rain. All the southern parts are in the course of the monsoon winds that bring so much rain to India (Sec. 373). The south coasts often have as much as 100 inches of rainfall a year. The rainfall is less in the north, and at Peking the amount is about 24 inches.

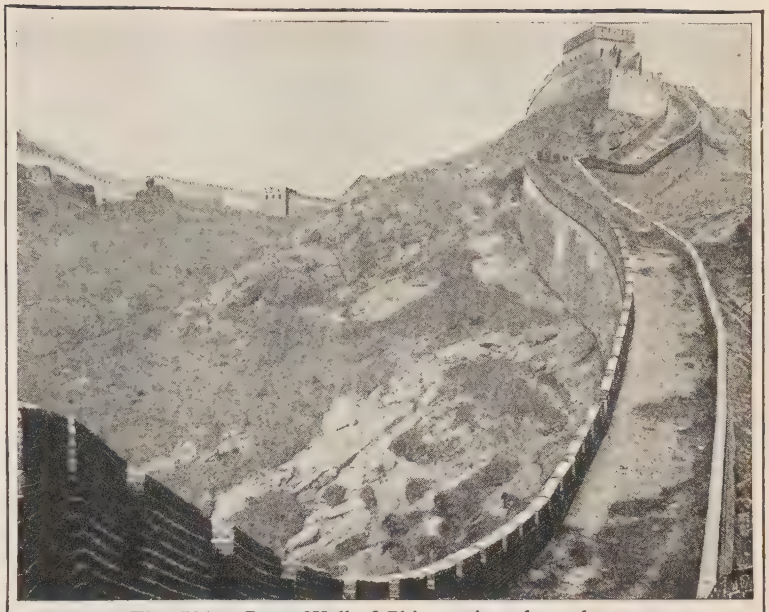

Fig. 521. Great Wall of China; view along the top

Violent storms sometimes start in the East Indies and sweep the Chinese coasts, doing great damage. They are called *typhoons*, and are like the West Indian hurricanes.

527. People of China.—This section refers only to the people of China proper, who number more than 300,000,000. They have tilled the soil, built cities, and have been a civilized people from very ancient times. Until the middle of the nineteenth century they lived almost by themselves. The mountains and deserts of the western provinces shut them away from western Asia and Europe. Siberia was a wilderness until the Russians built a railroad through it. The Himalayas and other mountains separated the Chinese people from India, Burma, and Siam. On the ocean it took months for a European sailing vessel to reach them, and they did not allow foreigners to trade in their coast cities. They thought they had the best institutions, learning, and arts, and they did not want to have anything to do with other nations.

They knew how to make the finest silk goods, and fine china ware. They manufactured paper and published books long before Europeans invented printing. Instead of using type, however, they printed from blocks of hard wood, each containing the engraved words for a whole page. Twelve hundred years ago they built a canal 700 miles long which is still used. Two hundred years before Christ they began to build the Great Wall, which still stands to show their skill and industry. It extends more than 1200 miles from east to west, across hills and valleys, and has many watchtowers. It was constructed as a defense against Mongolian invaders from the north, and it served its purpose, for these wild enemies were horsemen, and a small Chinese army could defend the wall against them (Fig. 521).

While the Chinese people have thus been for many centuries capable of great achievements, they have been slow to adopt new customs. They show great deference to parents. They have an excessive reverence for the past, and do not readily change from the habits and mode of life of their forefathers. They are disposed to think the old way is best, and they also fear that they will lose their work when railroads take the

Fig. 522. Cutting off the queue, in China

place of porters and junks, and when machines replace labor by hand. And yet the Chinese people have always shown great skill and industry and they are coming gradually to appreciate the modern point of view and the ways of western nations.

Fig. 523. Chinese passenger wheelbarrow

Woman has been in a low position in China, and many girl babies were formerly sold or put to death, because they were not wanted. The feet of girls were bound in infancy, so that they could not grow, and many women could hardly walk. This is changed now, foot-binding is no longer lawful, and women begin to have advantages that they have not had before.

For nearly three centuries the Chinese men shaved part of their heads and allowed the rest of the hair to grow, to be braided into a "queue" or "pigtail," as a sign of submission to the ruling dynasty of emperors. But since the downfall of those emperors the queue has become very unpopular.

The homes of most of the people are poor, being made of bamboo or of dried mud. Little fuel is used, although China has much coal, and modern mines are in operation. Many of the people try to keep warm in padded cotton garments. The roads are very bad, and only recently have attempts been made to improve city streets, or to build sewers to carry off the filth of the cities. Goods are carried on the backs of men and animals, or pulled along the streams and canals in boats. Both goods and men are transported on a kind of wheelbarrow with a large wheel in the center. In recent years, however, several important railroads have been built, and others are under construction.

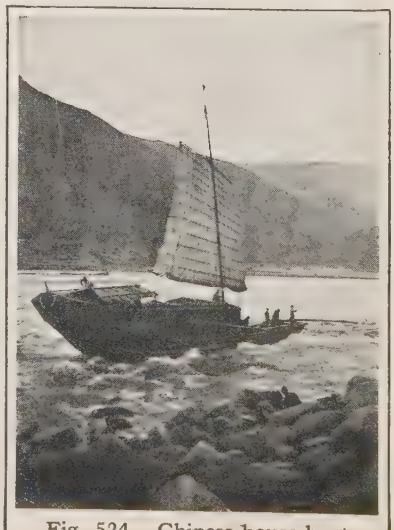

Fig. 524. Chinese house boat

528. Government.—About three hundred years ago the Manchu race, coming from the north, conquered China; and from that time on, until recently, the reigning sovereigns belonged to the Manchu dynasty. In modern times foreign nations, desiring Chinese trade, have gained permission to visit and settle in certain ports and in other cities. The Chinese have learned the value of foreign manufactures, such as cotton goods from our own country. Missionaries and teachers, especially from America and Great Britain, have introduced foreign ideas. The Manchu emperor was deposed in 1912, and a republic proclaimed; but there was long delay in adopting a constitution for the new government.

Fig. 525. Cells formerly used for examinations in China

Fig. 526. A Chinese school supplied with modern books

in the irrigating ditches and plant mulberry trees along the banks to feed silkworms. China is one of the leading countries of the world in the production of raw silk. This is largely because it has the cheap labor necessary for feeding the worms and unwinding the silk fibers from the cocoons (Sec. 449). Cotton is raised and is mainly consumed in home manufactures.

529. Agriculture.—To till the soil is thought highly honorable by the Chinese. The farms are small and are tilled with all the care usually bestowed on a garden. The Chinese farmers have long known that it is useful to change or rotate the crops. They save everything that can possibly be useful as a fertilizer; otherwise they could not have raised crops on the same ground for thousands of years. On the steep slopes they have made many terraces, as the farmers have in Italy and Germany, to prevent the washing away of the soil (Fig. 527). Even on the rivers, rafts are built and covered with soil for making gardens. Thousands of people have their little homes on such rafts, for every foot of space is precious where such a multitude must have homes and get a living.

The natural rainfall does not always provide moisture enough for the crops. In the plains, especially in central and southern China, water is laboriously raised from the rivers for irrigation, and for flooding the fields in raising the immense crops of rice that constitute a large part of the people's food. Two crops a year of rice and other products are commonly grown. The Chinese raise fish

530. Tea.—China supplies a large part of the world's tea. The plant or bush needs a warm climate, but will endure some frost. It requires plenty of moisture, but the water must not stand around the roots. Hence the warm, well-watered hillsides in much of China are good ground for the tea crop. Three times a year the leaves are picked, dried in the sun, heated, rolled in the hand, and then baked over fires of charcoal. This process, which causes fermentation, makes "black tea." In making "green tea," the leaves are roasted without being fermented. Some of the tea is pressed into "bricks," for convenience in packing in small

Fig. 527. Terraces built to save the soil, northern China

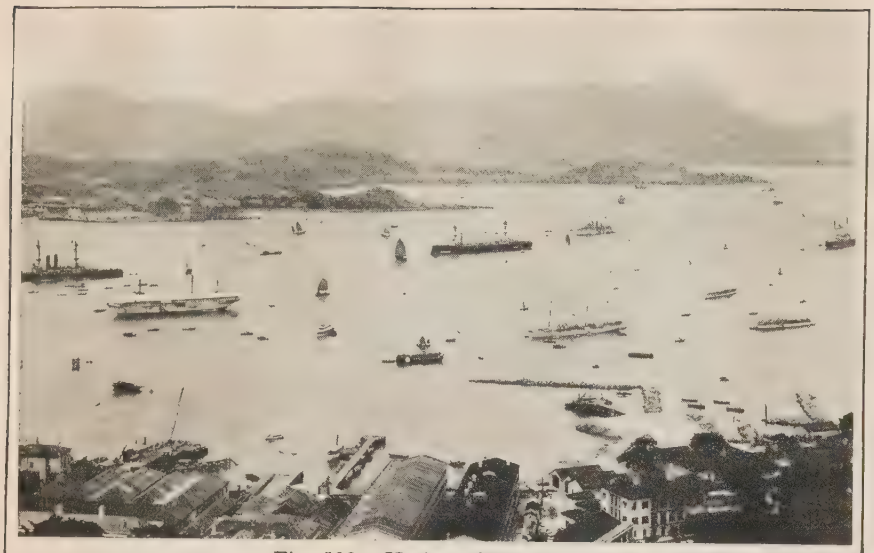

Fig. 528. Harbor of Hongkong

compass, and in carrying a great distance on pack animals. The cheaper bricks are made from the poorer leaves and small twigs.

531. Forests and Minerals of China.—The country is so old and so populous that most of the trees were cut down centuries ago. For this reason there is but little wood for use, and the soil on the hills has been subjected to great washing and loss. There are some forests in southern China and in the outlying provinces, but the people have yet to learn the practice of forestry.

The coal and iron deposits of China are among the most extensive in the world. There are also rich deposits of copper, gold, silver, tin, mercury, lead, and antimony. Much tin and antimony are exported.

532. Chinese Cities and Routes of Trade.—China has not many good seaports. Shanghai is by far the most important. Behind it is the vast and fertile Yangtze Valley, with many cities along the Yangtze River. Hankow, on this river, is the most important interior city of China (Fig. 519). Waterways bring it into communication with many rich provinces. The principal railroad of China runs north to Peking, and a connecting line is under construction from Hankow to Canton. This will furnish a trunk line for traffic from north to south through the richest part of the country. Far in the interior on the Yangtze is Chungking, the commercial center of western China.

In northern China are Peking, the capital, and Tientsin, the port of Peking. The seaport is a large city, commercially more important than the capital. These cities are joined by railroad with Siberia, by way of Manchuria.

The port of Kiaochow, greatly improved as a German possession before the World War, has been returned to China.

Canton is the chief city of the southern regions. It is one of the large cities of China and is a center of the silk trade.

Not far from Canton is the island of Hongkong, which belongs to Great Britain, although the largest part of its population is Chinese. The seaport of Hongkong is one of the greatest in the world, and rivals Shanghai as a place for Chinese trade.

Review.—1. Describe the physical geography of Tibet. 2. In what ways is the yak useful? 3. Name the chief river and principal cities of Sinkiang. 4. What desert is in Mongolia? 5. Why is Manchuria an important province?

6. Describe the Yangtze River and give the facts about its navigation. 7. Give an account of the Hwang River. 8. What is the loess? 9. Explain the differences of rainfall in the different parts of the country.

10. How were the Chinese long separated from other peoples? 11. In what industries have the Chinese people shown skill?

12. What are the leading agricultural products of China? 13. What conditions are best for raising tea? 14. In what minerals is China very rich? 15. Draw a map of China showing the chief rivers and cities.

Fig. 529. A valley in central Japan. Much of Japan is mountainous

EMPIRE OF JAPAN

533. Physical Geography.—The Japanese Empire embraces a chain of islands extending from the south end of the peninsula of Kamchatka almost to the Philippine Islands. In the central part is the main Japanese group of islands, of which Honshu is the largest and most important. To the northeast are the Kuril Islands, of volcanic origin, and containing several active volcanoes. These islands are small and barren. The south half of the large island of Sakhalin has belonged to Japan since the close of its war with Russia in 1905. To the southwest is another chain of small islands, — the Nansei group, — and southwest of these is the island of Taiwan, or Formosa. The ancient country of Korea, occupying a peninsula of Asia, has been made a part of the Japanese Empire, and is now called Chosen.

The main islands are mountainous (Fig. 529), and are partly of volcanic origin. They contain several active volcanoes, one of which is Fujiyama, with an altitude of over 12,000 feet. Earthquakes occur frequently, and some of them are very destructive. The houses are built low, so that they may withstand the strain of the shocks.

The empire ranges in latitude from 22° to about 51° north. The southern part of Formosa is south of the Tropic of Cancer. Because of such differences of latitude the climate varies from tropical in the south to cold in the north. A warm ocean current, known as the Japan current, flows northward along the coast. The rainfall is heavy, and in the north and on the higher mountains there is much snow. The forests, by reason of the moisture, are luxuriant and show a great variety of trees. Much forest growth has been preserved because most of the surface is hilly or mountainous and there is less temptation to cut away the trees on steep slopes in order to cultivate the land.

534. People of Japan.—On the Japanese islands there are about 55,000,000 of the Japanese people, and their country is so small that only their industry and skill enable them to support themselves. They belong to the yellow, or Mongolian, race. They are somewhat like the Chinese, but are smaller in

stature, and more keen and active. Some are trained from infancy to be athletes, and they perform wonderful acrobatic feats. As in China, the civilization is very ancient, and the people kept foreigners away until modern times. The head of the nation is the Emperor (sometimes called the Mikado), whom the Japanese regard with feelings close to those of worship. There are two assemblies, or legislative bodies, one consisting of the nobility, and the other of representatives chosen by the people. Not all the people, however, are allowed to vote.

Fig. 530. Bamboo forest, Japan

Fig. 531. Bamboo baskets

The Japanese are intensely patriotic. They are very brave, and very willing to lay down their lives in battle. In the war with Russia, which closed in 1905, they showed great military skill. They had accurate knowledge of the country, provided ample food and pure water for their soldiers, showed skill in preventing disease and in surgical operations and nursing, and won great victories on sea and land.

535. Industries.—The Japanese have for many hundred years been skillful in many arts. Among these is the weaving of silk and the making of mattings. Their fine porcelain and glass ware are greatly admired, and are seen in the museums, art stores, and homes of people in Europe and America. The Japanese also excel all others in the art of lacquering. From the sap of a kind of sumac they make the lac, which is a varnish. They inlay woods in beautiful patterns, and then apply the lac, which when dried is given a high polish. As in India and China, many useful objects are made from bamboo (Fig. 531).

The progress of Japan during the past fifty years has been wonderful. The people are quick to learn, and they readily adopt or imitate the customs and industries of others. They have had a great desire to adopt the inventions and modern ways of Europe and the United States. They send many young men to foreign universities and engineering schools to study modern industries in the western

Fig. 532. Picking tea in Japan

world. When they return they can set up cotton-mill machinery and build ships or railroads as well as any other trained engineers. They also have large and well equipped universities of their own, and only a few of the professors in these schools are men from other nations.

There are more than 8000 miles of railway in Japan, a large mileage in view of the fact that the country is mountainous, and has few places that are as much as seventy-five miles from the sea.

Fig. 533. Street decorated for a festival, Yokohama

Rice is the main crop and, as in China and India, it is one of the principal foods. Barley and other grains also are raised. Japan produces a very large part of the world's supply of silk. Tea also is grown, as in China, India, and Ceylon. Some cotton is raised, but the main supply for Japan's numerous cotton mills is imported from the United States.

The waters about the islands abound in fish, and the fishing industry is very large, for the population must seek food of all kinds, when the area of tillable land is small.

Iron and coal are among the important minerals of Japan, and this is fortunate for the people, as they are establishing mills, building railroads, constructing ships, and engaging in commerce. The deposits of copper are large, and this metal also is of great value now that electrical power is much used. New manufactures, new openings for trade, new lines of steamships — all these are promoted with tireless energy by the wide-awake Japanese people.

536. Cities.—Tokyo, the capital, has over two million people. Yokohama is the port for Tokyo, and although much smaller than the capital city, it is the chief center of foreign trade. The principal Pacific steamships from Canada and the United States call at Yokohama. In September, 1923, these two cities and the surrounding region were greatly damaged by earthquake and fire. Osaka, the second city of Japan in population, has many cotton factories.

537. Chosen.—Chosen, formerly called Korea, occupies a large peninsula of the mainland of Asia across the Japan Sea from the island of Honshu. It was annexed to Japan in 1910, but for several years before that date Japan had exercised large influence in its affairs.

Most of the people of Chosen are engaged in agriculture. The most important crops are rice, wheat, beans, tobacco, and cotton. Live stock is raised chiefly for home use, and some whale fishing is carried on. The mineral wealth of the country includes copper, iron,

Fig. 534. Station at Vladivostok, terminus of the Siberian railroad

Fig. 535. Cotton warehouse, Bokhara

and coal, all of which are found in abundance, and also some graphite and mica. Seoul is the chief city.

Review.—1. What is the range of latitude in the Japanese Empire? 2. Name the more important islands and island groups. 3. Give facts about rainfall and forests. 4. Compare the Japanese with the Chinese people. 5. In what kinds of manufacture are the Japanese skillful? 6. What recent advances have they made? 7. Name the chief cities of Japan. 8. Where is Chosen, and what are its resources?

ASIATIC RUSSIA

538. Russia in Asia.—The former Russian Empire included Siberia, Caucasus, Turkestan, and other provinces, with a total area almost equal to that of South America and a population much smaller. After the World War these provinces declared themselves independent republics, but they soon fell again under Russian influence or control.

539. Siberia.—Siberia was once known as a cold, barren wilderness to which Russian convicts were sent for exile. Thousands of these people had committed no worse crime than to criticize the government, or in some way to seek the reasonable liberty for themselves and their fellow-Russians that the citizens of all well-governed countries have enjoyed for many years. It gradually came to be known that the Siberian country had good soils, much timber, and many minerals. The Russian government gained control of some of the Pacific coast of Asia, and built the Siberian railroad, which extends from Leningrad to Port Arthur and Vladivostok, a distance of almost 6000 miles (Fig. 534).

After the Siberian railroad was finished, the country through which it passes was settled by more and more people from European Russia. They found it profitable to raise wheat, rye, oats, and other crops, to keep live stock, and to open mines, because the products could now be carried to people who would buy them. Not only the products of Siberia, but tea from China and other goods go overland from eastern Asia to Europe.

Among the chief cities of the interior are Tomsk and Irkutsk, the latter near Lake Baikal, a large, deep body of fresh water.

The vast region of Siberia has been divided into several main divisions. These are Tiumen, Siberia, Yakutsk, Mongol-Buriat, and the Far East, each of which is in greater or lesser degree under control of the Russian government. Much of Mongolia is now largely under the influence of Russia.

540. Kirghiz, Turkestan, etc.—In Turkestan, Kirghiz, and Bokhara, semi-independent countries east of Caspian Sea, deserts and mountains occupy most of the land, and there are few cities. In this region is Lake Aral, which, like Great Salt Lake and the Dead Sea, is a body of salt water. The Russians have built a railroad southeast into the interior of Asia, with a branch leading westward to the frontier of Persia, and extending to the Caspian Sea. Some grain is raised, and the Russians have also promoted the raising of cotton in this region (Fig. 535), so that they need not import so much from the United States and other countries. The wool of sheep, goats, and other animals is woven by the natives into rugs, many of which are sold in the United States.

Fig. 536. Oil well, Baku, before the flow was brought under control

541. The Caucasus Republics.—In the region that lies south of European Russia, between the Caspian and Black seas, are a number of republics under Russian control, including Azerbaijan, Georgia, and Armenia (Fig. 501). The Caucasus Mountains run through the region from east to west. South of them the climate is suited to grapes, corn, cotton, and other products of temperate and subtropical latitudes.

A large amount of petroleum is obtained in a small district at Baku on the Caspian Sea (Fig. 536). Much of the oil is transported by rail to Batum on the Black Sea, and thence is taken by ships to many lands. It is also used as a fuel by steamers on the Caspian Sea and on the Volga River. Tiflis (Fig. 537), the largest city of the Caucasus region, is an ancient center of trade.

Review.—1. For what was Siberia formerly used? 2. What are its chief resources? 3. Give an account of the Siberian railroad. 4. Locate Lake Baikal and name a city near it.

5. Where is Lake Aral? What is its character? 6. Describe the lands near it.

7. In which republic is Tiflis (Fig. 501)? 8. What is the great industry of Baku?

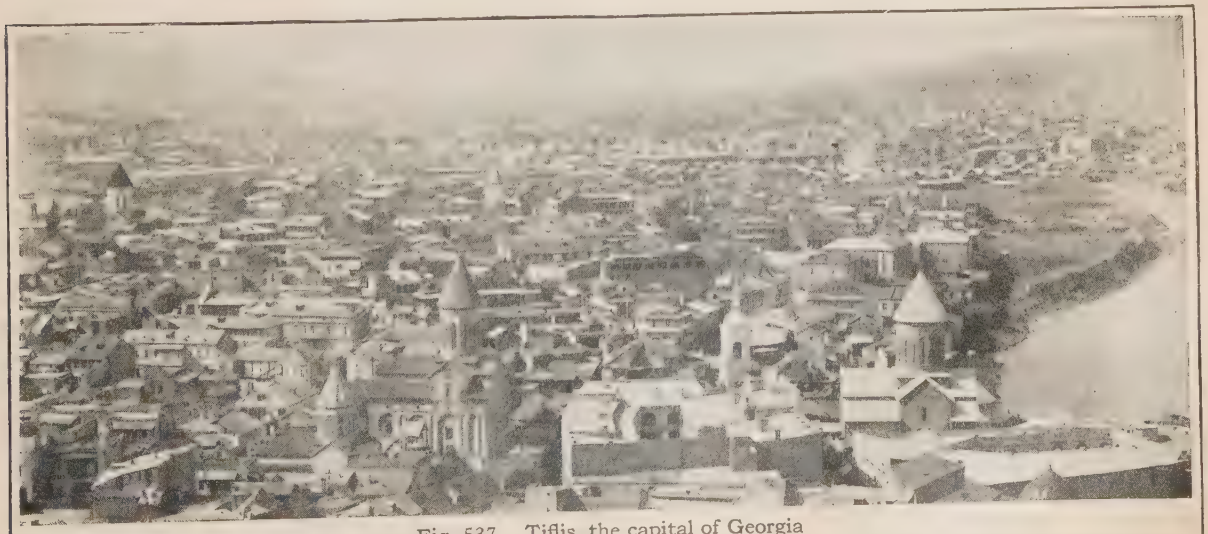

Fig. 537. Tiflis, the capital of Georgia

ATLANTIC OCEAN
INDIAN OCEAN
Mediterranean Sea
Black Sea
Caspian Sea
Red Sea
Persian Gulf
Gulf of Aden
Gulf of Guinea
Libyan Desert
Nubian Desert
Sahara
Tropic of Cancer
Tropic of Capricorn
Equator
Paris
Marseille
Madrid
Barcelona
Lisbon
Rome
Naples
Constantinople
Smyrna
Athens
Tiflis
Baku
Teheran
Bagdad
Damascus
Jerusalem
Aleppo
Port Said
Alexandria
Cairo
Suez
Siut
Keneh
Kharga
Assuan
Medina
Mekka
Port Sudan
Suakin
Berber
Dongola
Khartum
Omdurman
Asmara
Massaua
Abeshr
El Obeid
Sennar
Kodok
Adis Abeba
Harar
Jibuti
Berbera
Obbia
Mogadisho
Kismayu
Mombasa
Zanzibar
Dar es Salaam
Tanga
Tabora
Kilwa Kisiwani
Lourenço Marques
Beira
Quilimane
Mozambique
Majunga
Tamatave
Tananarivo
Fianarantsoa
Diego Suarez
Tullear
Durban
Johannesburg
Pretoria
Bloemfontein
Port Elizabeth
East London
Grahamstown
Cape Town
Kimberley
Mafeking
Windhoek
Swakopmund
Walfisch Bay
Port Nolloth
Angra Pequena
Mossamedes
Benguela
Loanda
Kasanje
Leopoldville
Brazzaville
Libreville
Coquilhatville
Ponthierville
Stanleyville
Bangui
Fort Lamy
Kano
Kuka
Sokoto
Zaria
Zungeru
Bauchi
Ibadan
Lagos
Abeokuta
Porto Novo
Akkra
Cape Coast
Kumassi
Bingerville
Monrovia
Freetown
Konakry
Bulama
Bathurst
Dakar
St. Louis
Kayes
Bamako
Timbuktu
Segu
Sikaso
Kourassa
Wagadugu
Ideles
Ghadames
Tripoli
Bengazi
Solum
Murzuk
Ghat
Gatrun
Tibesti
Tarso Mts.
Tummo Mts.
Algiers
Oran
Constantine
Tunis
Susa
Sfax
Biskra
Tugurt
Wargla
Colomb-Bechar
Fez
Rabat
Casablanca
Tangier
Tetuan
Melilla
Gibraltar
Strait of Gibraltar
Funchal (Port.)
Mogador
Morocco
Villa Cisneros
Wadan
Adrar
C. Blanco
C. Bojador
C. Verde
C. Palmas
C. Frio
C. Agulhas
C. Delgado
C. Corrientes
C. Ste. Marie
Cape Verde Is.
Canary Is. (Sp.)
Madeira Is.
Ifni (Sp.)
Rio de Oro
Mauritania
Senegal R.
Niger R.
Benue R.
Volta R.
Congo R.
Kasai R.
Ubangi R.
Shari R.
Chad L.
Victoria L.
Albert L.
Edward L.
Rudolf L.
Nyasa L.
Tanganyika L.
Kivu L.
Moero L.
Bangweolo L.
Ngami L.
Victoria Falls
Zambezi R.
Limpopo R.
Orange R.
Kunene R.
Rovuma R.
Juba R.
Blue Nile
White Nile
Atbara R.
Sobat R.
Gulf of Guinea
Mt. Kenya
Mt. Kilimanjaro
Ruwenzori Mts.
Stanley Falls
Stanley Pool
Aruwimi R.
Makua R.
Mbomu R.
Bahr el Ghazal
Bahr el Arab
Kafia
Abyssinia
Uganda
Kenya
Nyasaland
Rhodesia
Northern Rhodesia
Southern Rhodesia
Southwest Africa
Bechuanaland Prot.
Basutoland
Swaziland
Transvaal
Orange Free State
Natal
Cape of Good Hope
Union of South Africa
Belgian Congo
French Equatorial Africa
French West Africa
French Sudan
Territory of the Niger
Nigeria
Anglo Egyptian Sudan
Italian Somaliland
French Somali Coast
British Somaliland
Portuguese Guinea
Spanish Guinea
Fernando Po (Sp.)
Princes Is. (Port.)
St. Thomas I. (Port.)
Annobon I. (Sp.)
Gabun
Ascension I. (Br.)
St. Helena I. (Br.)
Aldabra I. (Br.)
Comoro Is. (Fr.)
Pemba I.
Mafia I.
Zanzibar
Mauritius I. (Br.)
Reunion I. (Fr.)
Sokotra (Br.)
Guardafui C.
Amber C.
Channel
Mozambique Channel
Madagascar
Fig. 538
Political
AFRICA
Scale of Statute Miles
0 250 500 1000
750 MILES TO ONE INCH
Capitols thus: ⊙
Railroads: In operation —— Proposed - - - -
Mandatory Protectorates over former German Colonies
I Part of Togo to Great Britian
II Part of Togo to France
III Part of Cameroon to Great Britian
IV Part of Cameroon to France
V German Southwest Africa to Union of South Africa (British)
VI Part of Ger. East Africa to Great Britian
VII Part of German East Africa to Belgium
COPYRIGHT, BY AMERICAN BOOK COMPANY
20° Longitude West 10° from Greenwich 0° 10° Longitude 20° East 30° from 40° Greenwich 50°

Fig. 539. Lifting water from the Nile, for irrigation, by means of jars on the vertical wheel at the right

AFRICA

	Area, Sq. Mi.	Population	Capital
Abyssinia	312,000	8,000,000	Adis Abeba
Liberia	36,800	1,500,000	Monrovia
Egypt	400,000	13,387,000	Cairo
British Possessions	3,848,100	46,042,000	
French Possessions	4,287,400	40,728,000	
Portuguese Posses.	801,500	8,150,000	
Italian Possessions	774,500	1,675,000	
Spanish Possessions	106,240	1,330,000	
Belgian Congo	947,200	15,400,000	Boma

Map Study.—1. Compare the coast lines of Africa and Europe. 2. How many degrees south of the Tropic of Capricorn is the Cape of Good Hope? 3. How many degrees does Africa extend north of the Tropic of Cancer? 4. From the map, estimate the part of the continent that is in the Torrid Zone.

5. Locate the Atlas Mountains; the Ruwenzori Mountains. 6. Locate the Sahara; the Libyan Desert; the Kalahari Desert.

7. What sea is between Africa and Asia? 8. Locate the Gulf of Aden.

9. Describe the course of the Nile; the Niger; the Congo; the Zambezi. 10. Where is Lake Chad? 11. In what respect is it like the Caspian Sea? 12. Locate Lake Tanganyika; Lake Nyasa; Lake Victoria.

13. What three groups of islands are west of Africa and north of the Equator? (See Fig. 350.) 14. Allowing sixty-nine miles for a degree of latitude, how long is the island of Madagascar?

15. What parts of Africa belong to France? To Great Britain? To Italy? To Belgium? To Portugal? (Fig. 350.) 16. What city is at the head of the Nile delta? At one of the mouths of the Nile? 17. Name three other important cities on the north coast. 18. What city is at the union of the White Nile and the Blue Nile? 19. Where on the east coast is Mombasa? Lourenço Marques? 20. Find the following cities of South Africa: Cape Town; Johannesburg; Kimberley. 21. Find Monrovia and Freetown on the west coast, and Leopoldville on the Congo. 22. Locate Walfisch Bay and name the European nation that controls it.

PHYSICAL GEOGRAPHY

542. Coast Line and Surface.—Africa is three times as large as Europe, and yet it has a shorter coast line. The outline is very regular, and there is not a single deep indentation like the Adriatic Sea or the Baltic Sea. Around almost the whole continent there is a narrow lowland, which in many parts is so hot and unhealthful that white men cannot live upon it. Back of this low coast strip the surface rises, and becomes a

ATLANTIC OCEAN
EUROPE
ASIA
Bay of Biscay
Pyrenees
Black Sea
Caucasus Mts.
Caspian Sea
Mediterranean Sea
Strait of Gibraltar
C. Spartel
C. Bon
Gulf of Gabes
Gulf of Sidra
Below Sea Level
Atlas Mts.
MADEIRA IS.
CANARY IS.
Wady Draa
C. Bojador
Suez Canal
Isthmus of Suez
Mt. Sinai
Arabian Desert
Red Sea
Persian Gulf
Libyan Desert
Tropic of Cancer
Sahara
Tummo Mts.
Tarso Mts.
1st Cataract
2nd Cataract
3rd Cataract
4th Cataract
5th Cataract
6th Cataract
Nubian Desert
Nile
Albara R.
Atbara R.
Blue Nile
White Nile
C. Blanco
C. Verde
Senegal R.
Gambia R.
Niger R.
Niger Plateau
L. Chad
Shari R.
Bahr el Ghazal
Bahr el Azrak
Abyssinian Plateau
L. Tsana
Hab-el-Mandeb
Gulf of Aden
SOKOTRA
C. Guardafui
Abyssinia
Kaffa Hills
Bight of Benin
Cameroon Mts.
C. Palmas
Gulf of Guinea
FERNANDO PO I.
Bight of Biafra
PRINCES I.
ST. THOMAS I.
Equator
C. Lopez
ANNOBON I.
Benue R.
Ubangi R.
Makua R.
Lake Albert
Murchison Falls
Ruwenzori Mts.
L. Rudolf
Mt. Elgon
L. Edward
Stanley Falls
Mt. Kenya
Lake Victoria
L. Kivu
Kirunga Mts.
Congo R.
Stanley Pool
Kasai R.
Lukuga R.
L. Tanganyika
Mt. Kilimanjaro
19,720
INDIAN OCEAN
PEMBA I.
ZANZIBAR I.
MAFIA I.
ALDABRA I.
ASCENSION I.
ATLANTIC OCEAN
ST. HELENA I.
Kubanga R.
Kuando R.
Kubango R.
Zambezi R.
Victoria Falls
Mushilda Mts.
L. Nyasa
Rovuma R.
Mt. Zomba
C. Delgado
C. Amber
COMORO IS.
Mt. Amber
Mozambique Channel
MADAGASCAR
MAURITIUS I.
REUNION I.
C. Frio
L. Ngami
Walfisch Bay
Kalahari Desert
Tropic of Capricorn
C. Corrientes
Delagoa Bay
C. Ste. Marie
Orange R.
Vaal R.
Drakensberg Mts.
Nieuwveld Mts.
6000
C. of Good Hope
C. Agulhas
20° Longitude West 10° from Greenwich 0°
10° Longitude East 20° from Greenwich 30°
40°
50°
Fig. 540
Physical
AFRICA
Scale of Statute Miles
0 250 500 1000
750 MILES TO ONE INCH
ELEVATIONS IN FEET.
OVER 5000
2000 TO 5000
1000 TO 2000
SEA LEVEL TO 1000
LAND BELOW SEA LEVEL
Depths in Fathoms.
0 to 100
100 to 1000
1000 to 2000
over 2000
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THE MATTHEWS-NORTHRUP WORKS, BUFFALO, N.Y.

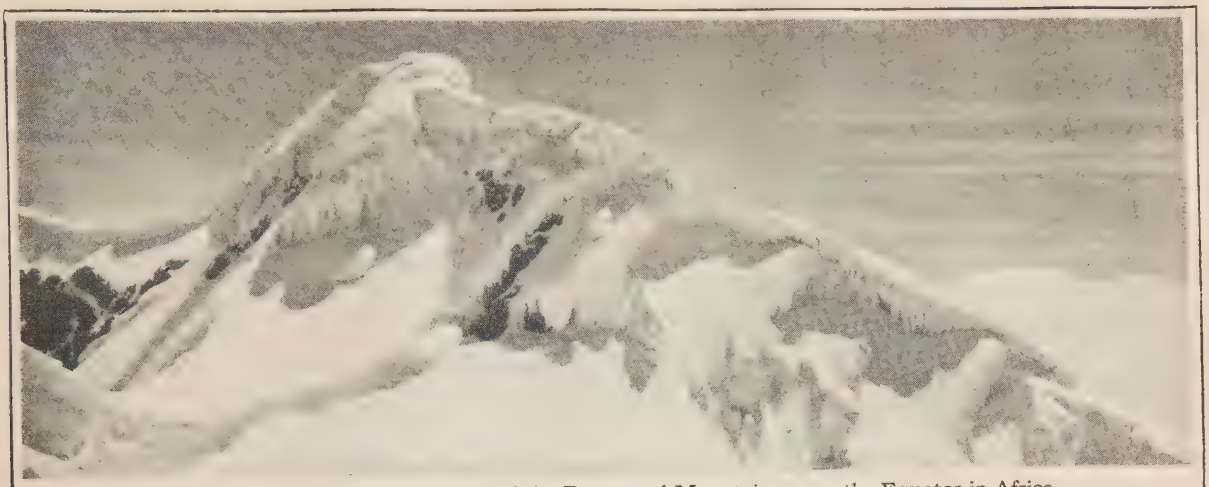

Fig. 541. A snow-covered peak of the Ruwenzori Mountains, near the Equator in Africa

plateau over most of the continent. Much of the interior plateau is from 2000 to 4000 feet in altitude, and all the great rivers descend from the upland to the coastal lowland by a series of rapids or falls. Above these falls the larger rivers are navigable for hundreds of miles into the interior of the continent.

Africa has fewer high mountains than any other continent except Australia. The range known as the Atlas Mountains extends through northern Africa about 1400 miles, from the Atlantic Ocean to the eastern part of Tunis. The highest point in these mountains has an altitude of nearly 15,000 feet. The Ruwenzori Mountains are a short, high range in central Africa, whose tops are covered with snow and glaciers, the highest peak rising to 16,600 feet (Fig. 541). Eastern Africa has a highland that extends from the Zambezi River to the Red Sea. Upon it, near Lake Victoria, is the volcanic peak Kilimanjaro, rising to 19,720 feet. Abyssinia occupies a lofty plateau, above which volcanic peaks reach to a height of about 15,000 feet above sea level. But Africa has no mountain range equal in size to the Himalayas, the Andes, or the mountains of western North America.

543. Rivers and Lakes.—Africa has four great rivers. The longest of these is the Nile, which rises in the region of the great lakes of east-central Africa, and flows northward to the Mediterranean. On the way, it receives the Blue Nile, which descends from the Plateau of Abyssinia on the east. The Nile is 3700 miles long. Its headwaters are in the region of large rainfall along the Equator and in Abyssinia, and the supply of water is so great that it flows for hundreds of miles through a desert and enters the sea as a large stream.

The Congo River is somewhat shorter, but has a still larger volume of water. Some of its headwaters are near the sources of the Nile, but it flows westward, and hence, all the way to the sea, is in a region of plentiful rain, and receives large tributaries. Its falls are below Leopoldville. Above that place it is navigable for 1000 miles, and steamboats traverse also many of its larger tributaries. From the lower part of the river, which is navigable, a railroad has been built around the falls to Leopoldville. From the mouth of the Congo, therefore, freight may be carried, first by boat, then by rail, and again by boat, to the interior of the continent.

The Niger is the great river of that part of western Africa north of the Equator. It flows northeast for a long distance, and then turns to the southeast and finally enters

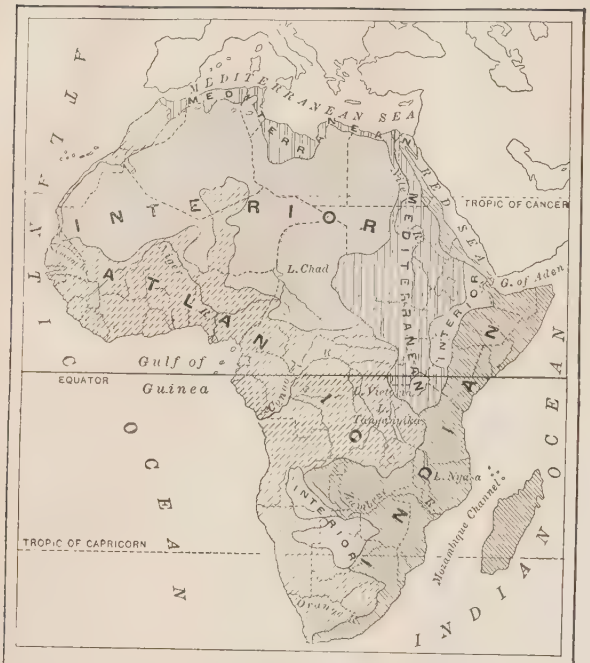

Fig. 542. Drainage basins of Africa

the Gulf of Guinea. The Niger is navigable in most of its course, but rapids at several points prevent the passage of steamboats from one part to another.

The Zambezi is the principal river of southern Africa. It rises near sources of the Congo, and flows eastward to the Indian Ocean. In the course of the Zambezi are the Victoria Falls (Fig. 543), which are nearly three times as high as Niagara.

In the highlands of east-central Africa are several lakes which compare in size with the Great Lakes of North America. The largest are Victoria, Tanganyika, and Nyasa. Their waters are fresh, and finally reach the sea through the Nile, Congo, and Zambezi.

South of the Sahara is Lake Chad. It is fed by rivers but has no outlet. It varies in size from 10,000 to 20,000 square miles, because it is in a region which has much rainfall during part of the year, and very little during the remainder. The lake is shallow, and during the dry season so much water disappears by evaporation that much of the lake bottom is laid bare.

544. Climate.—Central Africa lies along the Equator, and we have learned (Sec. 367) that the equatorial region usually has heavy rains. It is a region of intense heat and much evaporation, and where the air rises and is chilled the rainfall is abundant. As the belt of equatorial calms passes back and forth over this part of Africa each year (Sec. 368), there are two seasons when the rainfall is heavy.

Both north and south of this region are belts of land which during a part of the year are under a vertical sun in the region of equatorial calms, and at other times are subject to the trade winds. Thus the Sudan in Africa, lying between equatorial Africa and the Sahara, is well watered in our northern summer, but in our northern winter is traversed by the northeast trades, which blow far across Asia and Africa, and are dry winds. In the Sudan is Lake Chad, which is much larger during and just after the rainy season than it is during the dry season.

Fig. 543. Victoria Falls on the Zambezi River

The greater part of northern Africa is always in the course of the northeast trade winds, and hence is a desert (Fig. 367). This is true of the Sahara, of the Libyan Desert, and of Egypt except where it is irrigated. The Sahara extends westward to the shores of the Atlantic, because the winds come from the land and not from the water. Morocco, Algeria, and Tunis have more rain than the regions to the southward, especially in the winter, for at that time of the year these countries are in the belt of the westerly winds.

Southern Africa is across the track of the southeast trade winds. Hence the east coast is well watered, but the interior and the west coast are for the greater part dry. The Kalahari Desert is in this part of the continent.

Fig. 544. Lion

Fig. 545. Hippopotamuses, mother and young

As a whole, Africa is more in the tropics and has higher temperatures than even South America. It is drier also, because it is mostly a plateau and has no great mountain ranges, like the Andes, to condense the moisture brought by the winds.

545. Forests and Animal Life.—As the climate of most of Africa is either hot or subtropical, the vegetation is mostly such as is found in warm countries. The largest trees and heaviest forests are in the hot, rainy region near the Equator, especially in the basin of the Congo River. These forests, like those of the Amazon, are tangled and dense, with trees, shrubs, and vines, which shield most of the ground so completely that the sun's rays do not reach it.

North and south of this forest belt are *savannas*, or grasslands, with trees in the river valleys and reeds in the marshes. Trees do not flourish in the savannas, because rain falls only part of the year, by reason of the northward and southward movement of the equatorial calm belt. They are like the llanos of Venezuela and the campos of Brazil (Sec. 314). In the deserts of the trade wind belts are many oases with groves of date palms, which supply an important article of food. In the Mediterranean belt, which is more temperate, the vegetation is much like that of southern Europe, including palms, oaks, the olive, and the vine.

Many large wild animals are found in Africa, such as the elephant, rhinoceros, giraffe, leopard, lion (Fig. 544), and hippopotamus (Fig. 545). Camels are much used as beasts of burden in the deserts of northern Africa. The quagga and zebra, animals of the horse family, are numerous in the grasslands. Among other African animals are apes, chimpanzees, gorillas, baboons, and monkeys. In the tropical forests, as in those of other continents, there are many venomous reptiles, and many birds with brilliant plumage. The ostrich of southern Africa is raised for its feathers. Ants are numerous and build mounds ten or fifteen feet high. The white ants destroy almost anything made of wood.

Fig. 546. Zulu warriors, negroes of southern Africa

Review.—1. What is peculiar about the great rivers of Africa? 2. Where are the sources of the Nile? The Congo? 3. Why does the Sudan have a wet and a dry season each year? 4. Where are the trade wind deserts of Africa? 5. Why is one so much larger than the other? 6. What is the vegetation of the African savannas? 7. Why do they have few forests? 8. What are the principal wild animals of the continent?

PEOPLE AND HISTORY

546. The People.—The countries along the Mediterranean are occupied almost entirely by people of the white race. Some of them are called Berbers. They have lived in North Africa since ancient times. They are a wandering or nomadic people, and inhabit the mountain districts. Others are Arabs, or Moors, descendants of the men who, 1200 years ago, overran north Africa and conquered it for the Mohammedan faith. It was then and in the period following that the Moors crossed the Strait of Gibraltar, and ruled much of Spain (Sec. 458). The Mohammedans have planted their faith even south of the Sahara, and about a third of the people of Africa are believers in their prophet. There are some Jews also in the Mediterranean parts of Africa, and some who hold to ancient forms of Christianity. There are a few Italians, Frenchmen, and other Europeans, especially in the cities along the coast.

Central and southern Africa have always been the home of the black, or negro, race (Fig. 546). There are innumerable tribes of them, and the white man found most of them living in dense ignorance and darkest savagery. For several hundred years the white foreigner only made these conditions worse, for he came to Africa for little else than to hunt down the negroes in the forest, lead them in gangs to the seacoast, shut them up in terrible confinement in slave ships, and sell them into bondage in America and other lands. If he found them making slaves of one another, offering human sacrifices, killing a chief's wives after his death, or shooting their enemies with poisoned arrows, he had no excuse for finding fault with them, for he treated them worse than they treated one another.

Great changes have been made within the last fifty years, for civilized nations no longer sanction the slave trade. The natives are being kept in order by foreign powers, and many of them are learning how to labor. Missions and mission schools are teaching them the lessons of civilized life. It is not easy for some of the natives to learn to work, for they live in a warm region where they can get along with little clothing and shelter, and where the forest provides food.

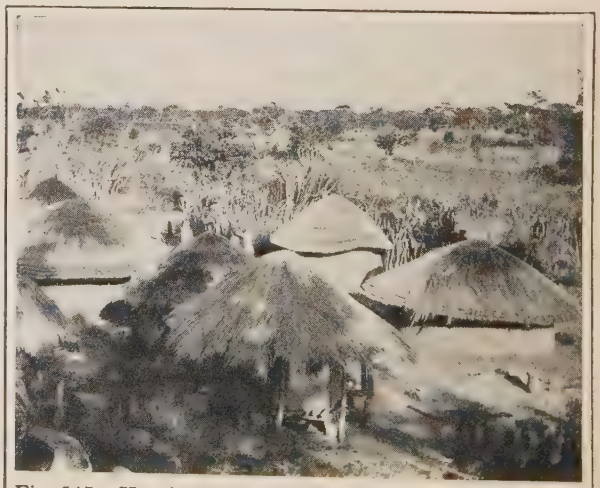
Fig. 547. Kraal, or village, of negroes in southern Africa

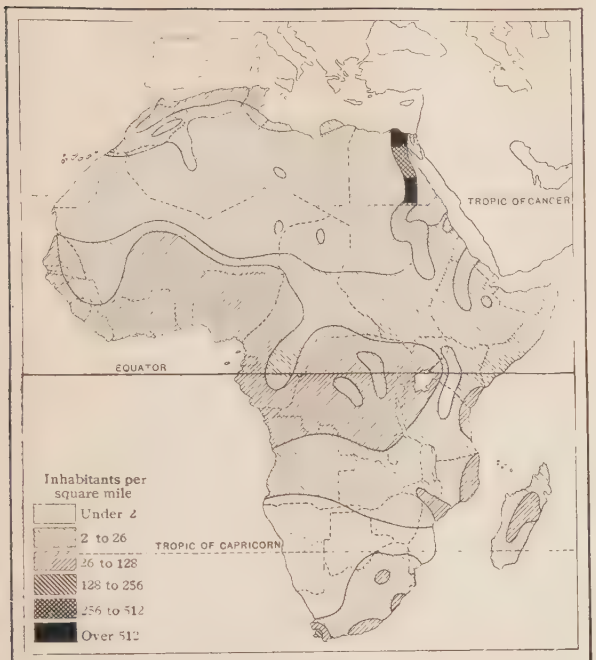

Fig. 548. Distribution of population in Africa

For more than 3000 years northern Africa has been known to history, but central and southern Africa have been largely unknown until within sixty years. Hence Africa has been called the "dark continent." There are several reasons why it has been backward. The coast is regular, and has few good harbors. The coast lands are low, hot, and so unhealthful that the region is called the "white man's grave." The rivers are interrupted by falls, so that boats cannot go from the sea to the interior. Unlike America, with its small original population, Africa had many millions of savages, ready to attack foreigners who ventured into her wild forests or over her savannas and deserts. Until recent years the white man went to Africa for slaves, and for ivory supplied by the tusks of elephants, and for little else.

547. Exploration.—The entire Mediterranean and Red Sea coasts were known by the people of Asia and Europe long before the time of Christ. The early narratives of the Bible have much to say about Egypt. The Phœnicians and the Greeks had colonies on the southern shore of the Mediterranean from Egypt to Gibraltar. They had some commerce in ivory and ostrich feathers, which must have come from the interior. But Africa beyond the Sahara was little known to the ancients, who called it Ethiopia. It is believed by some that one of the ancient navigators sailed around Africa. If this is true, the people had lost the knowledge of it, for when Vasco da Gama, a Portuguese navigator, in 1497 sailed around the Cape of Good Hope, he was regarded as having made a great discovery. He went to India and returned safely to Lisbon in 1499.

In the last century two British explorers more than any others made the "dark continent" known to the world. The first was David Livingstone, a Scotchman, who went to southern Africa as a medical missionary in 1840, and worked as a missionary and explorer until his death in 1873. He learned much about the Zambezi and the region of the great lakes at the sources of the Nile and Congo. The other was Henry M. Stanley, who was sent by a New York newspaper in 1869 to find Dr. Livingstone. He made great discoveries in central Africa, especially in the Congo basin.

548. The Cape-to-Cairo Railroad.—All the European countries that own parts of Africa are active in building railroads. One great plan will be described here and reference made to others in our study of African countries. The British control the greater part of the basin of the Nile. They have already built a railroad from Alexandria and Cairo to Khartum and beyond. They also control much of eastern and southern Africa. They have built a railroad from Cape Town 2000 miles northward, far across the Zambezi River. They expect to join these two lines and make the "Cape-to-Cairo" railroad, nearly 7000 miles long. New lines are under construction by the British and others, to connect this road with the shores of the Indian and Atlantic oceans.

549. Partition of Africa.—Europe is made up of large and small countries, most of which are independent. In Asia large sections are controlled by European nations, but there are also important countries, as Japan and China, that are self-governing. With but few exceptions, the countries of the Western Hemisphere are republics. Canada is a part of the British Empire, but its people are as free as those of any republic. Africa differs from the other continents by reason of the fact that nearly all of its territory has been divided among European powers. Liberia, Abyssinia, and Egypt are the only countries that are independent.

The countries that control most of Africa are Great Britain, France, Belgium, Italy, and Portugal. All these are small countries with a dense population. Portugal has had her African colonies since the days of early discovery, but the others have taken possession of parts of Africa within recent times. One reason for this "partition," or dividing, of Africa is that the European powers want land where some of their people can find new homes.

Another reason is that they want more raw materials for the factories at home. They hope to raise much cotton, for example, and not to be compelled to buy so much cotton from the planters of our southern states. They desire to find precious metals, as the British have found gold and diamonds in South Africa. They seek the forest wealth, just as Belgium makes much money from the rubber of Congo forests.

They also desire new markets for the steel, textiles, and other things which are made in European factories. If they can train the African negro to work, and produce things needed in Europe, and at the same time to desire things made in Europe, then commerce will be established and both the Europeans and the Africans will be benefited. It is, therefore, the growth of European nations and the desire for expansion of territory and trade that have led to the partition of Africa.

The interest of European nations in owning land in Africa became so strong that in 1885 a conference was held in Berlin, and many questions were settled, which helped to a peaceful division of the continent, by treaties. Germany soon gained nearly one tenth of Africa; but in the World War she lost most of Cameroon and Togo to the French, a small part of East Africa to the Belgians, and the rest of her African colonies to the British.

France and Great Britain together hold three fourths of all African territory. On the whole the British possessions are of the greater importance because of good soils and favorable climate. Among the regions in the British Empire are South Africa, Rhodesia, East Africa, and much of eastern Sudan. In western Africa, Nigeria on the lower Niger, Gold Coast, and Sierra Leone are under British control (Fig. 350).

France has Algeria and Tunis, on the Mediterranean, most of Morocco, most of the Sahara, French West Africa, Dahomey, French Equatorial Africa, and the island of Madagascar. Italy holds Eritrea on the Red Sea, Italian Somaliland, and Tripoli or Libia on the Mediterranean. Portugal retains from

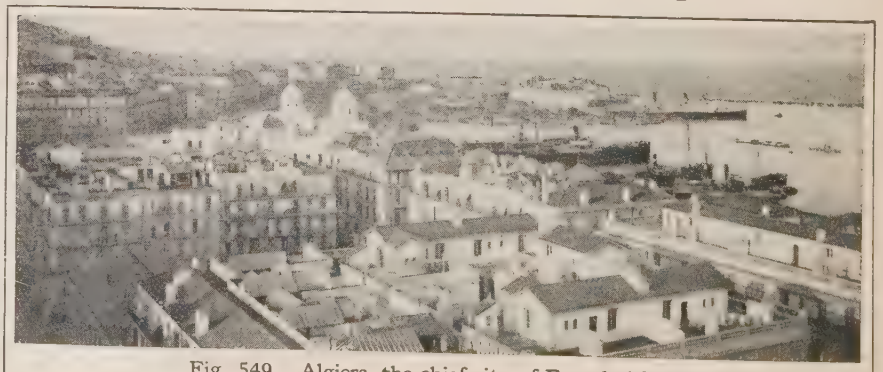

Fig. 549. Algiers, the chief city of French Africa

its provinces held by right of discovery, Mozambique, Angola, and Portuguese Guinea. Spain holds two small territories on the west coast, and controls part of Morocco. Belgium holds most of the Congo basin.

Review.—1. What races of people are found in northern Africa? 2. Give an account of the slave trade. 3. What improvements are taking place in the life of the negro tribes? 4. Why has Africa been a backward continent?

5. What nations explored the coasts of Africa in ancient times? 6. Give the name of the first modern sailor who went around the Cape of Good Hope to India, and the date. 7. Give an account of David Livingstone; of Henry M. Stanley.

8. Describe the Cape-to-Cairo railroad.

9. What is meant by the partition of Africa? 10. What are the principal parts of Africa belonging to Great Britain? To France? To Portugal? To Belgium? 11. For what reasons have European nations been eager to possess African territory?

Fig. 550. Pyramids in Egypt

COUNTRIES OF AFRICA

550. Egypt. — Civilized people lived in Egypt and maintained a strong kingdom for thousands of years before the time of Christ. Much of their ancient history has been learned in recent years by scholars who have translated the inscriptions and other writings that have been discovered. These have been preserved in Egypt, an arid country, while they would have been destroyed in a land with a moist climate and severe changes of temperature. The Egyptians took great care in embalming and wrapping the bodies of the dead, which are known as mummies. The mummies of some of the ancient kings have been discovered and identified.

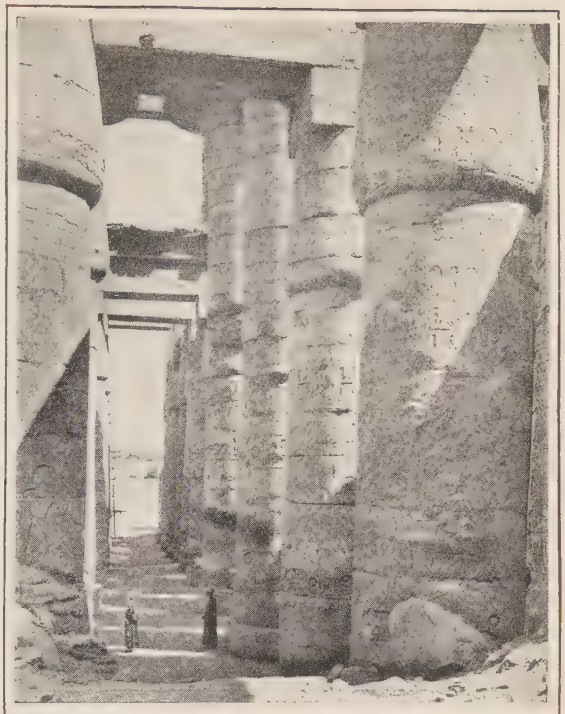

Fig. 551. Columns in the temple at Karnak, Egypt

The pyramids of Egypt, built of blocks of stone, were erected as burial places for kings (Fig. 550). The building of such pyramids required the work of thousands of men for many years. The largest of them are about 450 feet high. Temples with huge columns were made in the same way (Fig. 551). Single blocks of stone of great size were quarried, carved with inscriptions, and set up as monuments. These are known as obelisks, and some have been removed and set up in foreign cities, as in Rome, in London, and in Central Park, New York. The Sphinx is a giant statue carved out of rock.

Egypt, after centuries of Turkish misrule, became in 1882 a nearly independent monarchy, but for many years it was under British influence. By British aid the people prospered, because they were justly taxed and were taught to use good methods of tillage.

Fig. 552. Part of the Assuan dam

In 1922 Egypt was declared a sovereign state with its own king, but Great Britain continues to insure order and to protect the Suez route and neighboring colonies.

Egypt is several times as large as the British Isles, but most of it is a desert like the Sahara. The Nile flows through it from south to north, and for thousands of years the people have lifted or pumped the water out over the flood plain and the great delta at its northern end (Fig. 539). About 12,000 square miles are thus cultivated, and this area is the real Egypt. When the rains come along the upper Nile, and particularly in the Plateau of Abyssinia, the river rises many feet and floods the lowlands, giving them water and leaving a cover of fine, rich soil. Under British direction a dam about 6400 feet long was built at Assuan (Fig. 552), setting back the water and forming a lake or reservoir 200 miles long. This water is distributed over the fields, and increases the amount of land that can be cultivated.

Two or three crops are raised each year, and Egyptian agriculture is now very prosperous. Many crops of both temperate and hot climates are raised, including a large amount of wheat and other grains. The Egyptian cotton is of excellent quality, and the country stands next to the United States and India in the export of this fiber. Some Egyptian cotton is used in American mills for making special kinds of goods, but most of it goes to England.

There are more than 13,000,000 people in Egypt, and more than nine tenths of them are of the Mohammedan faith. Cairo (Fig. 553), at the head of the Nile delta, is the capital, and is the largest city in Africa, with a population of more than 750,000. In its museum is a remarkable collection of Egyptian antiquities. Its streets are full of quaint Oriental people of many kinds. Its dry and healthful air and its historical interest attract people of many lands, who make it a resort for the winter months. Alexandria still remains the chief seaport of Egypt, as it was in ancient times.

The Suez Canal extends from Port Said, on the Mediterranean, 103 miles to Suez at the head of the Red Sea. Of this distance true canals cover 76 miles, and lakes 27 miles. The canal was completed in 1869 after ten years of work. It is 35 feet deep, and accommodates all but very large ocean vessels. Before it was dug, Mediterranean commerce was much less important than now, for all European ships bound for the East were compelled to go around the Cape of Good Hope. Now they may go direct from London and other European ports by the Suez route to Bombay, Calcutta, Singapore, Hongkong, and the ports of Australia and New Zealand. In normal times about 5000 ships pass through the canal each year, with a tonnage of 20,000,000. The majority of the ships are British, but there are many under the French, Dutch, Japanese, Italian, and other flags.

Fig. 553. A street in Cairo

Fig. 554. Camel ready for a caravan journey

551. Tripoli, or Libia.— Tripoli was formerly part of the Turkish Empire, but is now controlled by the Italians, who have renamed it Libia. The country has a long shore line on the Mediterranean, but is mainly a desert with a scattering population of Berbers, Arabs, Jews, and desert tribes. The chief city is Tripoli. The harbor is poor and the approach difficult. The sands and shoals of this part of the Mediterranean were dreaded by ancient seamen, and navigation is still dangerous. Along this shore the Greek sponge divers come with ships to gather sponges from the sea bottom.

Fig. 555. Date palms, Algeria

In the deserts of Libia and in other parts of northern Africa a plant known as esparto grass is found. It has strong fibers. The stems are gathered, bound into huge bundles, and carried by camels to the sea, where they are put on ships and sent to England for making paper.

Tripoli has always been a center for the caravan trade. The trails reach across the Sahara to Timbuktu, Lake Chad, and all parts of the Sudan country. Some caravans are small, and some have thousands of camels with their drivers and guards, and carry goods having a value of hundreds of thousands of dollars. A caravan journey across the Sahara takes several months, and is full of danger, for bands of robbers are common in the desert. They know where all the wells and springs are, and often exact tribute from passing caravans even when they do not plunder them. Camels (Fig. 554) are the only animals that can carry burdens across the desert, because they can go five days or more, if necessary, without drinking. Each animal carries a load of about 300 pounds, and a day's march lasts sixteen hours.

The caravans bring from central Africa or the Sudan region, ivory, ostrich feathers, and skins, and carry back to the natives various products of Europe, such as cloths of cotton and wool, beads, paper, drugs, and sugar. The largest item is cotton goods from Great Britain. The caravan trade is not so large as it was, for railroads are being built in the countries south of the Sahara.

552. Tunis and Algeria.— Tunis and Algeria are under the control of France. They are more progressive countries than Tripoli. There are more railroads in these countries than in most parts of Africa, and there are thousands of miles of telegraph and telephone lines. Tunis and Algiers are the two capitals. They are well-governed cities, and are visited every winter by many Americans and other tourists. Much wheat is raised in Algeria and sent to France. Barley, oats, and corn also are large crops. Grapes and many tropical fruits, such as oranges, bananas, figs, olives, and dates (Fig. 555), are raised. Much wine is made and exported. Cork oaks yield an important export of cork bark. Esparto grass is gathered and exported, as in Tripoli. Sheep and other live stock are kept.

Fig. 556. Nile steamboat landing, at Khartum

553. Morocco.—Morocco has been until recently an entirely independent country, ruled by an absolute monarch called the Sultan. Its resources are like those of other north African countries, but most of its people live in ignorance and barbarism, and it is not yet an orderly or safe country. France has recently gained some control over most of the country, and may in time give Morocco as good government as Algiers and Tunis now have. Spain controls a small part of Morocco. Tangier, in an "international zone," is the principal city and seaport.

554. Sudan Countries and Abyssinia.—The Sudan is the region extending across Africa, south of the Sahara, from the Atlantic Ocean to Abyssinia and the Red Sea. On the south are the Gulf of Guinea and the watersheds between Lake Chad and the Congo River system. As we have learned (Sec. 544), it is intermediate in heat and rainfall between the tropical forests and the Sahara. Many of the negroes of the Sudan, west of Lake Chad, belong to the Hausa tribes, which are among the best and most prosperous people of the African black race.

France governs the central and much of the western part of the Sudan. In the west the chief center for trade between the Sudan and the Sahara is the ancient city of Timbuktu on the northern bend of the Niger. It is the center of many caravan trails, and the French plan to connect it by a railroad with their possessions in northern Africa. On the Gulf of Guinea are Nigeria and the Gold Coast, under British rule, and Dahomey and the Ivory Coast, under French rule. These are tropical countries with a hot climate, unhealthful near the coast, but with large resources of mine, forest, and field. The Gold Coast produces more cacao than any other country in the world.

In the western part of the Sudan are the small republic of Liberia and the British colony and protectorate of Sierra Leone. Liberia was founded as a home for freed American slaves. All industries are in a backward state. Monrovia is the chief city. Sierra Leone exports palm oil and kola nuts. Freetown is the greatest seaport in west Africa.

East of French Equatorial Africa is Anglo-Egyptian Sudan, which nominally belongs to Egypt and Great Britain, and is being developed under British control. The capital is Khartum, on the Nile (Fig. 556). The fierce natives were subdued by a British-Egyptian army in 1898, and order was established, opening the way for agriculture and civilized life. The Cape-to-Cairo Railroad (Sec. 548) has been finished some distance south of Khartum, and a branch line extends to the Red Sea.

To the east is Abyssinia, a region of plateaus and mountains, which still remains under a native ruler. Most of the inhabitants accept an ancient form of Christianity. The country has many mineral and other resources, but it has made little progress in modern methods of industry.

555. Countries along the Equator.—Among the countries crossed by the Equator are French Equatorial Africa, Belgian Congo, Uganda, and Kenya, the two last named being British possessions.

Following the journeys of Livingstone and Stanley, there was new interest in the Congo region, and the Berlin Conference in 1885 agreed that the Congo Free State should be

formed, and placed under the care of the King of Belgium. In 1908 it was formally annexed to the kingdom of Belgium and is now known as the Belgian Congo. Railroads and steamboats, traders and missionaries, have done much to open this tropical forest, and to improve the condition of its native negro tribes. A railroad runs around the falls of the lower Congo, and, above these, boats can go hundreds of miles on the great river and its tributaries (Fig. 557). Palm nuts are an important product. Much ivory (Fig. 558) has been obtained here and carried out to all parts of the world, both by the river and by caravan across the Sahara, but the supply is decreasing. Other products are rubber, white copal, cacao, coffee, tobacco, copper. The largest import is cotton goods, showing that the native negroes, of whom there are many millions, are learning to wear clothes.

Fig. 557. Steamboat on the Congo River at Leopoldville

French Equatorial Africa and the former German protectorate of Cameroon are northwest of the Belgian Congo, and have similar resources.

British colonies in eastern Africa extend from the Belgian Congo eastward to the Indian Ocean. In the northern parts are some of the sources of the Nile. The region includes Uganda and the colony of Kenya, with Mombasa the chief seaport. A railroad has been built from this city to the shores of Lake Victoria.

Fig. 558. Arab trader buying ivory in central Africa

South of the region just described is Tanganyika Territory, the part of German East Africa taken by Great Britain in the World War. It has millions of native people, a great variety of tropical products, a railroad from lake to ocean, and is being developed by European money and skill. Off the coast are the island and city of Zanzibar, which have long been under British control.

556. Countries of Southern Africa.—Portugal has colonies both on the west and on the east coast of southern Africa. In the eastern colony there is valuable territory along the Zambezi River, and there are two important ports, Beira and Lourenço Marques.

Most of the richer parts of southern Africa are under the British flag. The oldest towns are in the province of Cape of Good Hope, which was first settled by the Dutch and afterward occupied by the English. Then many of the Dutch, or *Boer* farmers, as they were called, " trekked," that is, they moved on to the north, or into the interior. They founded the Orange Free State and the Transvaal Republic. But when much gold was discovered in the Transvaal, many British and

Fig. 559. Cape Town, South Africa

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other gold seekers went in and there were disputes that finally led to the Boer War and the conquest of both republics by Great Britain. They are now provinces in the Union of South Africa, which has a government somewhat like that of Canada. The other two provinces of the Union are Natal and Cape of Good Hope. Natal is a province on the east coast with Durban as its seaport. The principal city and seaport of Cape of Good Hope is Cape Town (Fig. 559).

To the north, Rhodesia, named for Cecil Rhodes, who did much to develop South Africa, stretches northward to Belgian Congo and East Africa.

Southwest Africa, a former German colony, has been placed under the control of the Union of South Africa. It is largely a desert region, with a small population.

South Africa produces grain, and supports many sheep and cattle. A large amount of wool is exported, and there are many ostrich farms (Fig. 560). Gold is mined near Johannesburg (Fig. 561) in the Transvaal, and this locality is by far the greatest gold producer of the world.

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Fig. 560. Ostriches, mother and young

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Fig. 561. A gold mine at Johannesburg, South Africa

Fig. 562. Bottom of a diamond mine, Kimberley

At Kimberley in Cape of Good Hope are the largest diamond mines in the world. The gems are dug in a rough state out of masses of partly decayed volcanic rock (Fig. 562). The native laborers are watched and searched to see that they do not steal these precious stones. When sold, most of the diamonds go to Antwerp or Amsterdam to be cut and polished, after which they find their largest market in the United States.

Fig. 563. Funchal, the seaport of the Madeira Islands

557. African Islands.—The Madeira (Fig. 563) and Cape Verde Islands (Fig. 350) belong to Portugal, as do also the Azores, but the last are too far away to be called African islands. St. Helena is a small island off the southwest coast, chiefly known as the place to which Great Britain exiled Napoleon Bonaparte several years before his death. The Canary Islands belong to Spain.

The largest of African islands is Madagascar. It is larger than France or Germany, and is under French rule. It has a population of about 3,000,000, mostly natives descended from the Negro and Mongolian races (Fig. 564). Agriculture and cattle raising are the main industries, but the island has graphite and other minerals.

The islands of Reunion and Mauritius, in the Indian Ocean, are ruled by France and Great Britain respectively.

Review.—1. What are some of the great architectural works of the ancient Egyptians? 2. How is Egypt now governed? 3. How has the agricultural capacity of the country been increased? 4. Give an account of the Suez Canal. 5. Describe the caravan trade. 6. Name the countries of northern Africa. 7. What countries belong to the Sudan region? 8. How far south from Cairo has the Cape-to-Cairo Railroad been built? 9. What facilities for transportation are found in the Belgian Congo? 10. What bodies of water are joined by the chief railroad of British East Africa (Fig. 538)? 11. Give the history of German occupation in Africa; of Dutch occupation in southern Africa. 12. Name the chief seaport of Cape of Good Hope. 13. Where are the chief gold and diamond deposits of South Africa? 14. What are the other important products of South Africa?

Fig. 564. Water carriers, Madagascar

CHINA
BRITISH INDIA
Hanoi
Hongkong
FORMOSA
FRENCH INDO-CHINA
HAINAN
Laoag
LUZON
SIAM
Bangkok
Manila
PHILIPPINE ISLANDS (To U.S.)
South China Sea
Gulf of Siam
Saigon
PALAWAN
Iloilo
Cebu
Malay Peninsula
Sulu Sea
MINDANAO
SULU ARCHIPELAGO
Celebes Sea
Molukka Passage
Strait of Malacca
Acinn
FEDERATED MALAY STATES
BRITISH NORTH BORNEO
LABUAN
BRUNEI (British)
SARAWAK
Singapore
Kuching
SUMATRA
BORNEO
Palembang
Banjermasin
Batavia
Samarang
EAST INDIES (Dutch)
Java Sea
Banda Sea
Sunda Strait
Surabaya
Surakarta
CELEBES
MOLUKKA IS.
Makassar Strait
TIMOR (Port.)
Arafura Sea
Torres Strait
THURSDAY I.
Port Moresby
Cape York
NEW GUINEA
TER. OF NEW GUINEA (Comm. of Aus.)
BISMARCK ARCHIPELAGO
(To Com. of Aus.)
Palmerston
Port Darwin
Gulf of Carpentaria
Kimberley
INDIAN OCEAN
NORTHERN TERRITORY
Northwest Cape
Great Sandy Desert
QUEENSLAND
Rockhampton
AUSTRALIA
Sandy Cape
WESTERN AUSTRALIA
Great Victoria Desert
SOUTH AUSTRALIA
Brisbane
Darling R.
Murray R.
NEW SOUTH WALES
Newcastle
Sydney
Canberra
Seat of Federal District and proposed new capital
Perth
Fremantle
Cape Leeuwin
Great Australian Bight
Albany
Adelaide
VICTORIA
Ballarat
Melbourne
Bass Strait
TASMANIA
Hobart
Tasman Sea
Coral Sea
C. York Peninsula
GREAT BARRIER REEF
NEW CALEDONIA (French)
Noumea
LOYALTY ISLANDS (French)
NEW HEBRIDES (Jointly by the British and French)
Suva
FIJI (British)
SOLOMON ISLANDS (British)
SANTA CRUZ IS. (British)
ELLICE ISLANDS (British)
UNION ISLANDS (British)
SAMOA
SAVAII (To N.Zea.)
Apia
UPOLU
TUTUILA (To U.S.)
TONGA OR FRIENDLY IS. (British)
COOK ISLANDS (British)
SOCIETY ISLANDS
Tahiti (To France)
AUSTRAL ISLANDS (French)
NORFOLK I. (British)
KERMADEC IS. (British)
Auckland
NORTH ISLAND
NEW ZEALAND
North Cape
East Cape
Wellington
Cook Strait
SOUTH ISLAND
Christchurch
Dunedin
CHATHAM IS. (British)
STEWART I.
South Cape
Tropic of Cancer
Tropic of Capricorn
Equator
MARIANAS (Jap.)
WAKE I. (To U.S.)
GUAM I. (To U.S.)
MARSHALL ISLANDS (Jap.)
CAROLINE ISLANDS (Japanese)
YAP
PELEW IS. (Jap.)
JALUIT
MICRONESIA
MELANESIA
POLYNESIA
MIDWAY I.
TERRITORY OF HAWAII (To U.S.)
Honolulu
HAWAII
PALMYRA I. (British)
FANNING I. (British)
CHRISTMAS I. (British)
BAKER I.
HOWLAND I. (To U.S.)
GILBERT ISLANDS (British)
PHŒNIX ISLANDS (British)
Fig. 565
Political
AUSTRALIA
AND ISLANDS OF THE PACIFIC
Scale of Statute Miles
0 500 1000 1500
885 MILES TO ONE INCH
Capitals: Commonwealth of Australia ◎ Other Capitals ◉
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THE MATTHEWS-NORTHRUP WORKS, BUFFALO, N. Y.
70° 80° 90° 100° 110° 120° 130° Longitude 140° East 150° from 160° Greenwich 170° 180° 170° Longitude 160° West 150° from 140° Greenwich

AUSTRALIA AND PACIFIC ISLANDS

	Area, Sq. Mi.	Population	Capital
Australia	2,972,866	5,437,000	Melbourne
New Zealand . . .	104,663	1,221,000	Wellington
New Guinea group .	311,000	1,000,000	
Other Pacific islands	68,850	1,100,000	

Map Study.—1. Give the latitudes of Melbourne and Cape York. 2. How many degrees of longitude are covered by Australia? 3. What large island is north of it? 4. What is the location of Tasmania? 5. Using the scale of miles, determine the distance from Sydney to Perth; from Sydney to Wellington in New Zealand.

6. Name and bound the five states and one territory of the Australian continent. 7. Name and locate the capital of each state. 8. Describe the courses of the Murray and Darling rivers. 9. Give the name of the chief mountain range of Australia and describe its position (Fig. 566).

10. From the map estimate what share of the surface of Australia lies in the Torrid Zone. 11. Compare the latitude of Auckland, in New Zealand, with that of Buenos Aires. 12. Compare the latitude and longitude of Auckland with those of London.

13. What group of islands in the Pacific Ocean is in longitude 180°? 14. Locate the Samoa group of islands; the New Hebrides; New Caledonia; the Solomon Islands.

558. Physical Geography of Australia.—Australia has sometimes been called an island, but it is so large and so far from other large lands that it may properly be called a continent. It is more than 2000 miles across from east to west, and it averages more than 1000 miles in width from north to south. The area is nearly 3,000,000 square miles, making it three fourths as large as Europe.

Every other inhabited continent is crossed either by the Arctic Circle or by the Equator, but Australia is between 10° and 40° south latitude. It is 4500 miles from Africa, and 7500 miles from South America. It is about 2000 miles by sea from Australia to Asia, though the journey lies among the East Indies. Even New Zealand, which we often name with Australia as being in the same part of the world, is 1000 miles away.

The coast line of Australia is somewhat like that of Africa, for it is but little broken by bays, and hence has but few natural harbors. Much of the interior is so dry that there are few rivers. Along some parts of the shore one might travel for hundreds of miles without crossing a river. Thirty miles or more off the northeast coast, the Great Barrier Reef, a coral formation, extends for about 1000 miles.

In surface, Australia consists of a central plain, bordered by mountains on all sides except on the south. There are, however, no very high mountains on the continent. The largest and highest mountains make up the Great Dividing Range, which follows the east coast, and is not very far from it. The highest parts are toward the south, where the range is sometimes called the Australian Alps, and has peaks more than 7000 feet in altitude. The mountains of the northern and western borders are lower.

The interior plain has many hills or low mountains. Most of the streams dry away or enter lakes which on account of the dry climate have no outlets. The largest rivers, however, the Murray and its tributary the Darling, flow westward from the Great Divide and carry their waters to the sea on the south. On the east, north, and west borders, short rivers flow from the mountains to the ocean.

The southeast trade winds bring ample moisture to the eastern parts of Australia, where they rise in crossing the slopes of the Dividing Range and are chilled as a result of

INDIAN OCEAN
PACIFIC OCEAN
AUSTRALIA
NEW ZEALAND
NEW GUINEA
TERRITORY OF PAPUA
Com. of Aus.
TERRITORY OF NEW GUINEA
Com. of Aus.
BISMARCK ARCHIPELAGO
NEW IRELAND
NEW BRITAIN
SOLOMON ISLANDS
NEW HEBRIDES
NEW CALEDONIA
LOYALTY IS.
NORFOLK I.
LORD HOWE I.
CHESTERFIELD IS.
BANKS IS.
TORRES STRAIT
Coral Sea
Tasman Sea
Arafura Sea
Timor Sea
Banda Sea
Java Sea
Flores Sea
Gulf of Papua
Gulf of Carpentaria
Great Australian Bight
Spencer Gulf
Encounter Bay
Cook Strait
Foveaux Strait
Tropic of Capricorn
Great Barrier Reef
Great Sandy Desert
Great Victoria Desert
Simpson Desert
Northern Territory
Western Australia
South Australia
Queensland
New South Wales
Victoria
Tasmania
Ashburton Range
Murchison Range
Macdonnell Range
Peterman Range
Darling Range
New England Range
Blue Mts.
Australian Alps
Cradle Mt. 5069
Mt. Kosciusko 7308
Mt. Albert Edward 13,230
Mt. Balbe 10,168
Mt. Bruce
Mt. Morgan
Mt. Cook 12,349
Mt. Ruapehu 9175
Wilhelmina Peak 15,420
Darling R.
Murray R.
Murrumbidgee R.
Lachlan R.
Flinders R.
Fitzroy R.
Victoria R.
Ashburton R.
Murchison R.
Gascoyne R.
Cooper Cr.
Diamantina R.
Georgina R.
Barcoo R.
Thomson R.
Condon
Port Headland
Broome
Roebourne
Derby
Wyndham
Kimberley
Collier Bay
King Sound
C. Leveque
C. Londonderry
Cambridge Gulf
Port Darwin
Palmerston
Pine Creek
Arnhem Land
C. Arnhem
Melville I.
Coburg Pen.
Somerset
Cape York
Cooktown
Cairns
Townsville
Charters Towers
Normanton
Mackay
Clermont
Rockhampton
Barcaldine
Alice Springs
Oodnadatta
Coober Pedy
Eucla
Ceduna
Port Augusta
Port Pirie
Broken Hill
Cobar
Bourke
Charleville
Roma
Toowoomba
Ipswich
Brisbane
Grafton
Kempsey
Maitland
Newcastle
Parramatta
Sydney
Goulburn
Canberra
Albury
Bendigo
Ballarat
Geelong
Melbourne
Adelaide
Petersburg
Kingston
Portland
Launceston
Hobart
TASMANIA
C. Howe
C. Wilson
Bass Strait
Site of Federal District and proposed new capital
Auckland
NORTH ISLAND
SOUTH ISLAND
Thames
Bay of Plenty
East Cape
Gisborne
Napier
Palmerston North
Wellington
Wanganui
Westport
Greymouth
Nelson
Christchurch
Timaru
Oamaru
Dunedin
Invercargill
Cook Strait
Foveaux Strait
STEWART I.
CHATHAM IS. (British)
North Cape
South Cape
C. Farewell
Broome
Geraldton
Perth
Fremantle
Northam
Boulder
Coolgardie
Kalgoorlie
Albany
Bunbury
Geographe Bay
C. Leeuwin
C. Arid
Eucla
Sharks Bay
Steep Pt.
Northwest Cape
Exmouth
Onslow
Carnarvon
Shark Bay
Dampier Archipelago
Roebourne
Great Sandy Desert
Gibson Desert
Tanami Desert
Barkly Tableland
Gulf of Carpentaria
Normanton
Mt. Isa
Cloncurry
Winton
Longreach
Charleville
Cunnamulla
Thargomindah
Birdsville
Lake Eyre
Lake Torrens
Lake Gairdner
Lake Amadeus
Lake Mackay
Lake Nash
Lake Frome
Lake Callabonna
Lake Blanche
Lake Gregory
Lake Macleod
Lake Disappointment
Lake Barlee
Lake Carnegie
Lake Darlot
Lake Ballard
Lake Wells
Lake Way
Lake Cowan
Lake Yindarlgooda
Lake Grace
Lake Muir
Lake Clifton
Lake Bullen Merri
Lake Wallace
Lake Corangamite
Lake Colac
Lake Tyrrell
Lake Hindmarsh
Lake Albacutya
Lake Buloke
Lake Boga
Lake Charm
Lake Tutchewop
Lake Lalbert
Lake Wallawalla
Lake Hattah
Lake Victoria
Lake Cullulleraine
Lake Tandure
Lake Bonney
Lake Alexandrina
Lake Albert
Lake Bonney
Lake Fergusson
Lake Leake
Lake Sorell
Lake Crescent
Lake Echo
Lake Gordon
Lake Pedder
Lake Burbury
Lake Rowallan
Lake Mackintosh
Lake Parangarahu
Lake Rotoiti
Lake Rotoma
Lake Rotorua
Lake Tarawera
Lake Okataina
Lake Waikaremoana
Lake Taupo
Lake Rotoaira
Lake Wairarapa
Lake Ellesmere
Lake Forsyth
Lake Wanaka
Lake Hawea
Lake Wakatipu
Lake Te Anau
Lake Manapouri
Lake Monowai
Lake Poteriteri
Lake Hauroko
Lake Ohau
Lake Pukaki
Lake Tekapo
Lake Alexandrina
Lake Ellesmere
Lake Forsyth
Lake Wairarapa
Lake Waikaremoana
Lake Taupo
Lake Rotoaira
Lake Rotoiti
Lake Rotoma
Lake Rotorua
Lake Tarawera
Lake Okataina

the greater elevation. It is in these mountains that the Murray and Darling rivers have their origin. The conditions are the same as in eastern Brazil and southeastern Africa. In the Australian summer, which occurs during our winter, the belt of equatorial calms and heat moves southward over northern Australia, and gives ample rain. In the Australian winter, occurring at the time of our summer, when the equatorial heat belt and the wind belts move northward, southwestern Australia gets some moisture from the prevailing westerlies of the Southern Hemisphere. In the summer, the westerly winds are too far south to touch Australia.

Fig. 567. Kangaroo

Fig. 568. Australian natives, with spears and boomerangs

The interior and the south-central coast of the continent are dry, and much of the land is a desert (Fig. 367). The climate is continental, hot in summer and cold in winter. Much of the interior has as little as five inches of rainfall a year. Parts of the east and north coasts have more than fifty inches.

The animals and plants of Australia are very different from those of other continents. The kangaroo (Fig. 567) is one of the peculiar native animals. Like many of the other Australian animals, it carries its young in a fold of its skin. Its front legs are short, but the hind legs and tail are long and strong. In leaping over the ground the animal stands nearly upright and uses its hind legs and tail. The common domestic animals have been introduced from other countries.

559. People of Australia.—The natives of the continent (Fig. 568) are a very dark-skinned people, who in many ways, however, are unlike the negro. They are thin and muscular, with heavy beards and straight or wavy hair. When the white man first came to Australia, these natives, or aborigines, were rude savages. Some of them are still wild men, but there are not nearly so many as when they had the land to themselves.

Soon after the time of the American Revolution, Great Britain began to settle Australia. Many of the first white inhabitants were convicts, sent out to Australia instead of being shut up in British prisons. Then a better class of people began to go in search of homes and of new chances to make a living. Thus Australia was occupied by several British colonies, including New South Wales, Victoria, Queensland, and others. In 1901 all these colonies, now called states, together with Tasmania, the large island south of the continent, were united to form the Commonwealth of Australia. Like Canada, this part of the British Empire is self-governing, but works in harmony with Great Britain in foreign affairs. Melbourne is the temporary capital, but buildings are now under construction for a permanent capital at Canberra. Australia has made many laws in favor of laborers. The people believe in a "white Australia," and prevent the immigration of the black or yellow races.

The population is less than that of London. About two thirds of the people are in the states

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Fig. 569. Sheep at a watering place, New South Wales, Australia

of New South Wales and Victoria, leaving only a sparse population in the remainder of the continent.

560. Products and Industries of Australia.—Agriculture and grazing are the main occupations in Australia. The same is true of Canada, Argentina, Siberia, and the newer parts of the United States. This is the rule in large countries that are young in development, and have broad plains suited for fields and pastures. The principal grain of Australia is wheat, and some wheat is sent abroad, particularly to Liverpool. Much fruit is raised, especially grapes, and much wine is made. In Queensland, where the climate is moist and hot, sugar cane is the leading product, and tropical fruits flourish.

Australia has over 80,000,000 sheep, and sends to the world's markets more wool than any other country. As merino sheep were taken from Spain to America, so they were carried to South Africa and Australia. The climate, and the grasses and other wild plants of the region, aid in producing wool of excellent quality, and there is room on the ranches for large flocks (Fig. 569). The event of the year is sheep shearing. The wool goes to one of the seaports and is transported to the mills of England and other countries.

Cattle also are raised, and hides, tallow, butter, and frozen beef, as well as frozen mutton, are shipped to Great Britain. Dairy supplies produced during the southern summer may in a few weeks reach England in the northern winter, when the cattle of Europe are living under cover on dry food.

Gold to the value of many hundred million dollars has been taken from Australian mines, and the country still ranks next after South Africa and the United States among the gold producers of the world. Silver, lead, copper, tin, and coal are found.

The Australians have most of the raw materials to make a rich and populous country, although manufacturing has not yet been extensively developed.

561. Cities and Routes of Australia.—There are two great cities in the Commonwealth, each with more than 700,000 people.

Fig. 570. Melbourne, Victoria

Fig. 571. Harbor at Sydney, New South Wales

One is Melbourne, the capital of the state of Victoria (Fig. 570). The other is Sydney, the capital of New South Wales (Fig. 571). Adelaide is the capital of South Australia (Fig. 572). Other important cities are Brisbane, the capital of Queensland (Fig. 573), Perth, the capital of Western Australia, and Hobart, the capital of Tasmania. Ballarat and Bendigo are mining towns in Victoria. As the interior is so dry, all the large cities are on the seacoast.

Fig. 572. Street in Adelaide

Most of the railroads are in New South Wales, Victoria, and Queensland. A railroad has been built near the south coast, across Australia from east to west, and another has been proposed which will run through the center of the country across the great desert, from the southern seaports to the northern shore.

A great sea route to Australia from Europe is by way of the Suez Canal and Aden to Adelaide and Melbourne. Another route runs from Colombo in Ceylon to Singapore and Sydney. To Sydney, steamships make regular trips from Vancouver and San Francisco. The route from London to Sydney by way of the Panama Canal is shorter than by way of the Suez Canal. Other sea routes pass around the Cape of Good Hope and Cape Horn, and many steamships ply between Australia and New Zealand. There is cable communication with southern Asia and with Vancouver. Many ships going between Australia, or New Zealand, and the western coast of North America, call at Honolulu in the Hawaiian Islands.

562. New Zealand.—The Dominion of New Zealand is part of the British Empire. There are two principal islands, separated by Cook Strait, and many small islands. The group is 1000 miles long, and contains a little more than 100,000 square miles. It is thus about as large as the state of Colorado. The population is somewhat over 1,000,000, including about 50,000 Maoris. These are the native people of the islands. They are a strong race, and many are now civilized and intelligent citizens of the British Empire.

Fig. 573. Brisbane, Queensland

Fig. 574. Lake and mountains in southern New Zealand

Much of the surface is mountainous, and has magnificent scenery (Fig. 574). Deep bays penetrate the shores among lofty peaks. Mountain ranges form the backbone of both the large islands, and there are regions of glaciers and perpetual snow, as well as active volcanoes, geysers, and other hot springs. There are many rivers, but most of them are short mountain torrents. There are also fertile plains. The industries are much like those of Australia. Except in the high mountains, the climate is mild. The rainfall is greatest on the west side, because the islands are in the course of the westerly winds. Wheat and oats are the leading field crops, and wool, frozen meat, butter, and hides and skins are the leading exports. Most of these go to Great Britain. Auckland and Wellington (Fig. 575) are the principal cities.

Fig. 575. Wharves at Wellington, New Zealand

563. Islands of the Pacific Ocean.—Thousands of islands are scattered over the Pacific, but only a few of the larger groups are important. Most of the East Indies are considered as belonging with Asia (Sec. 523). New Guinea, however, is near Australia and is somewhat like it as to its animals and plants. It is a vast island, with an area of more than 300,000 square miles. It has mountains which rise more than 15,000 feet above the sea. Australia and the Netherlands each control parts of the island. Near New Guinea, on the east, are the Bismarck Archipelago and the Solomon Islands.

The New Hebrides, New Caledonia, the Fiji, the Tonga (Fig. 576), and the Samoa islands (Fig. 577), are south of the Equator. New Caledonia is governed by France, and the New Hebrides jointly by France and Great Britain. There are 200 islands of the Fiji group alone, all belonging to Great Britain. The Samoa Islands are divided between the United States and New Zealand.

Fig. 576. Native children, Tonga Islands

Fig. 577. Native hut, Samoa

Some of the Pacific Islands are of volcanic origin, consisting of mountains and hills, and in some, as in Hawaii, active volcanoes are still found. These volcanic islands are sometimes referred to as the "high islands." In contrast are many "low," or flat islands due to coral growth (Fig. 578). The hard or stony parts of the corals are broken and worn by the waves into small bits. These accumulate and the waves push them above the surface of the ocean, forming islands.

The natives of most of the islands were originally savages, often cruel and degraded. By the heroic work of missionaries, and by the aid of foreign governments, most of the people have now come to an orderly and more or less civilized mode of life.

The principal value of the smaller islands to the United States, and to the nations of Europe, is as coaling stations, and as harbors for warships and the ships of commerce.

Review.—1. Describe the surface of Australia. 2. Explain the rainfall of the several parts of Australia. 3. Describe one of the native animals.

4. Describe the native people of Australia. 5. How did the British people first make use of the country? 6. What is meant by a "white Australia"? 7. When was the Commonwealth of Australia formed?

8. What are the chief agricultural products? 9. Give an account of sheep raising.

10. What are the principal seaports? 11. Name the two leading cities of Australia. 12. What railroad is planned? 13. Name the chief sea routes to other countries.

14. How far is New Zealand from Australia? 15. What is the length of the New Zealand group? The area? 16. Name some of the principal physical features. 17. What products are common to New Zealand and Australia?

18. Give an account of New Guinea. 19. What nation controls New Caledonia? The Fiji Islands? 20. Name two classes of islands, according to their surface. 21. What is the main value of the smaller islands to the nations that control them?

Fig. 578. Coral growing on a reef along the coast of Australia

THE EARTH AS A WHOLE

564. Size of the Earth.—The earth is a ball or globe, and its diameter, or the greatest distance through it, is nearly 8000 miles. The circumference is a little more than three times as great, or nearly 25,000 miles. It is not easy to imagine how large the earth is, although it does not seem so large as it did to our forefathers, because we can travel more swiftly than they, and can send messages by telegraph. Even now, a swift passenger ship would take about seven weeks to sail around the earth. If there were lands on which a railroad could be built at the Equator, a train moving forty miles an hour would require twenty-six days to make the journey.

565. Shape of the Earth.—The earth is not a perfect sphere, for it is flattened at each pole so that the polar diameter is about 26 miles shorter than the diameter at the Equator. But if a baseball or a school globe were flattened in this proportion the difference would be so small that we should fail to notice that it was not a perfect sphere.

Long before the time of Christ a few men believed the earth to be round. But most persons did not believe it until about four hundred years ago. They thought the earth was flat, and they had curious ideas as to what held it up.

If the earth were flat, the hull of a ship would be the last part to disappear from sight as the ship leaves a port, for it is the biggest part. But in reality the hull goes out of sight first, then the rigging, then the smoke, showing that the ocean has a curved surface. We know the ocean has a curved surface for the further reason that we can sail around the world and come back to the place we left.

When the earth's shadow falls on the moon, the edge of the shadow is always part of a circle. No object but a sphere will always cast a circular shadow. When we go from the Northern Hemisphere to the Southern, or from the Southern Hemisphere to the Northern, some stars go out of sight and others come into view. If the earth were flat, we should see the same stars wherever we went. In all these ways we know that the earth has a curved surface, and since the amount of curvature has been measured, it has been found that the curved surface is that of a sphere.

In former times men could not easily believe in a round earth, because they thought people would fall off from the other side of it. They thought people on the other side of the world would have their feet up and their heads down. But the only *down* is toward the center of the earth, and the only *up* is away from the center of the earth. Men and all objects are held to the earth by an invisible force called gravitation. For this reason any object thrown into the air falls again toward the earth's center. The attraction is what gives objects weight. It is not the earth's center, however, that exerts the force, but the whole mass of the earth. The gases that make up the atmosphere are bound to the earth in the same way. There is less air at the tops of high mountains than on low plains. We say that the air there is rare, and people have difficulty in breathing. The waters of the earth are gathered into the low parts, but they are spread over nearly three fourths of the earth's surface, because the surface is so nearly round.

566. Surface and Materials of the Earth.—We have already learned that the land surfaces are uneven, but the height of mountains is small compared with the diameter of the earth. The highest mountains rise less than six miles above sea level, while the earth's diameter is nearly 8000 miles.

The earth is everywhere surrounded by the atmosphere, which extends many miles

above the highest mountains. Below the atmosphere, the surface is made up of land and water. The land is nearly everywhere covered with soil, and under the sea almost everywhere are layers of mud. Under the soils of the land and the muds of the sea are the rocks that make up most of the globe. The rocks deep in the interior of the earth are believed to be very hot. One reason for thinking this is that the rocks increase in temperature the deeper we go down a mine shaft. We do not believe that the earth's interior is liquid rock, for it is all under such vast pressure that it would remain solid even if intensely hot.

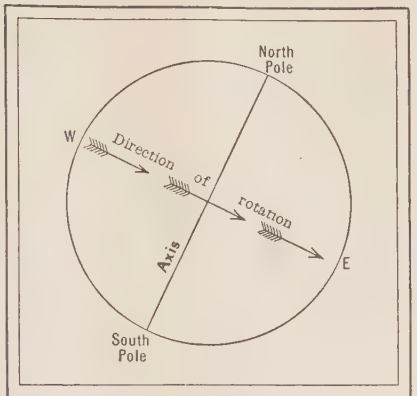

Fig. 579. Axis and poles

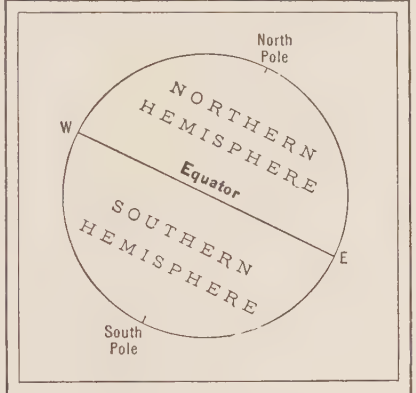

Fig. 580. Equator

567. The Rotation of the Earth.—The earth always turns or spins in the same direction. The line around which it turns we call the earth's *axis* (Fig. 579). One end of this line we call the *North Pole*, and the other end we call the *South Pole* of the earth. The motion is like that of a spinning top. We can think of a line passing through the center of the top, around which it turns. The Pole Star, or North Star, is so called because it is almost in line with the earth's axis. It is always above the North Pole.

We can also think of a line running around the earth, just halfway between the poles. This circle we call the *Equator*, because it divides the earth into two equal parts or hemispheres. North of the Equator is the Northern Hemisphere, and south of the Equator is the Southern Hemisphere (Fig. 580).

The earth makes a complete turn on its axis once in twenty-four hours. This movement is toward the east, where the sun rises, or comes into view in the morning. At the Equator, any person or thing at the surface of the earth travels in one complete rotation about 25,000 miles, or more than 1000 miles an hour. A person is not blown away and does not feel the motion, because the air and everything else around him is moving as fast as he is moving.

568. Directions and the Compass.—Toward the North Pole is north, and toward the South Pole is south. At the North Pole one could not face in any direction but south, and in moving away from the Pole one must go south. At the South Pole the observer faces north, and could not move away from the Pole in any direction but north. The earth turns toward the east and from the west. These four main directions are the *cardinal points*. We also name intermediate directions, such as northeast, southeast, south-southeast.

A compass consists of a magnetic needle mounted on a pivot, so that it will turn freely (Figs. 581, 582). In the mariner's com-

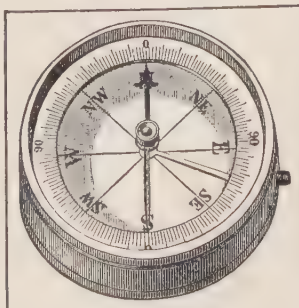
Fig. 581. Engineer's compass

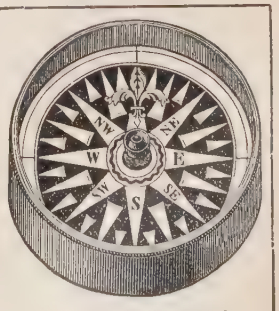
Fig. 582. Mariner's compass

pass the needle carries with it a card showing the directions (Fig. 583). It does not point exactly north except in a few places, but points in general toward a locality in the north of Canada called the North Magnetic Pole. In some parts of the land and sea the needle points west of north, in others east of north. Maps are prepared showing how much the needle varies from true north, and thus the sailor or the explorer can allow for the compass variation.

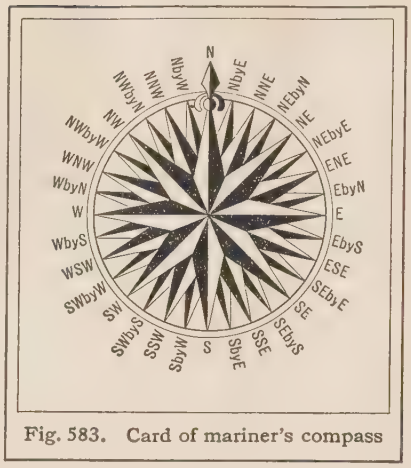

Fig. 583. Card of mariner's compass

569. Latitude.—Every circle is divided into 360 equal parts, and one of these parts is a degree; 360 degrees is written 360°. Each degree is divided into 60 minutes, written 60′, and each minute into 60 seconds, written 60″.

Since a whole circle is 360°, a quarter of a circle is 90°. From pole to pole is 180° on a great circle drawn around the earth through both poles. Angular distance from the Equator to the poles, measured on such a great circle, is called *latitude*,—north latitude, if measured from the Equator north; south latitude, if measured south. One degree of latitude covers about 69 miles of distance. A circle running around the earth parallel to the Equator is a *parallel of latitude* (Fig. 584). All points on such a circle are at equal distances from the Equator. We can draw as many parallels as we like, but it is common to draw them on maps at intervals of 5°, 10°, or 20°. The parallels on a globe are shorter as we go away from the Equator.

If a person were at the North Pole, the Pole Star would be nearly overhead, or in the zenith. If he were at the Equator, it would be on the horizon. If he moved north from the Equator, for every degree he traveled, the North Star would rise one degree above the horizon. Hence the angular distance of the star above the horizon anywhere is nearly the latitude of that place.

Sailors often wish to know the latitude when they cannot see the star. They use an instrument called a sextant, and find out the height of the sun at noon (Fig. 362). Astronomers furnish tables by which the traveler or sea captain can reckon his latitude from the facts learned by using the sextant.

570. Longitude.—Angular distance around the earth from east to west, or west to east, is called *longitude*. If it is noon at any place, it is noon at all places directly north and south on a line running from pole to pole through the place. Such a line is called a *meridian*, or midday line (Fig. 584). We can imagine as many meridians as we like. In giving longitude it is customary to choose one meridian as the starting place from which to measure. This is called the *prime meridian*. The one commonly used is the meridian

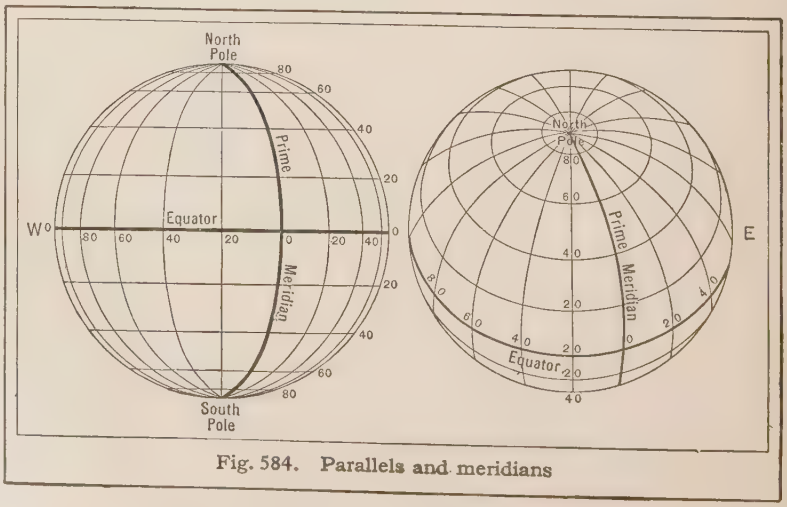

Fig. 584. Parallels and meridians

of the national observatory at Greenwich, in the eastern part of London. From that meridian, most nations speak of all points eastward up to 180°, as in east longitude, and all points westward up to 180°, as in west longitude. A degree of longitude on the Equator measures about 69 miles. North or south of the Equator any two meridians, a degree apart, gradually approach each other until they come together at the poles. Hence the length of a degree of longitude, measured on circles that constantly decrease in size from the Equator toward the poles, diminishes from 69 miles at the Equator to zero at either pole.

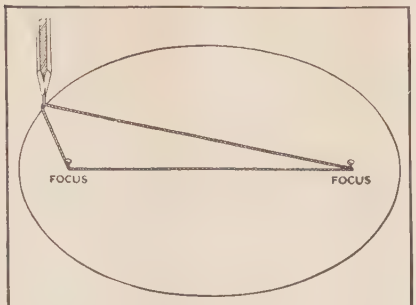

Fig. 585. An ellipse may be drawn by aid of a cord attached to two points called focuses

When a ship captain sails from London to New York, he carries a chronometer, — which is a good watch or clock, — keeping Greenwich time. Every 15° of longitude makes an hour's difference in time (for 15° is one twenty-fourth of 360°). Hence if the chronometer indicates 3 o'clock P.M. Greenwich time, when it is only noon where the ship is, the captain knows he is 45° west of Greenwich, or in west longitude, 45°. On land, people in different places are able to get each other's local or sun time by telegraph, and, by reckoning 15° difference for every hour's difference in time, to find the difference in longitude.

We could not sail the ocean, explore the wilderness, or make accurate and useful maps, if we did not have the system of locating places by their latitude and longitude.

571. The Sun.—Without the sun it would be impossible for animals and plants to live on the earth. Although but a slight part of the sun's heat and light falls on the earth, it makes all the difference between a dead and frozen world, with endless night, and an earth covered with seas and fertile soils, with grasses, flowers, forests, and animals.

When we shrink from the heat of the sun on a summer day, it is hard to believe that the sun is so far away. We can go within a short distance of the hottest bonfire, but we seek a shade tree or a porch to shield ourselves from rays of heat that have traveled 93,000,000 miles, a distance which is too great for us to comprehend.

The sun is more than a million times as large as the earth, and more than 300,000 times as heavy. We cannot understand such size any more than we can realize the sun's distance. The outer parts of the sun are made up of hot gases, and glowing tongues of these gases leap out for thousands of miles.

572. The Revolution of the Earth.—The earth moves around the sun once each year. The curve or track which it follows is called its *orbit*. As the earth is about 93,000,000 miles from the sun, the distance across the orbit is about 186,000,000 miles. This orbit, or track, is not quite a circle, but is drawn out very slightly in the form of an ellipse (Fig. 585). The sun is at one focus of the ellipse. The exact shape of the earth's orbit is shown in Figure 592. For this reason the earth is about 3,000,000 miles nearer the sun at one time in the year than at another.

The earth has kept its place in the orbit, and for ages it has made its journeys around the sun, because of the attraction of gravitation. If there were no attraction of gravitation, the earth would not follow its track but would fly off into space.

We may think of the orbit as in a plane surface like the top of a table. The axis of the earth is not at right angles (90°) with the plane of the orbit, but is inclined $23\frac{1}{2}$° away from that position (Figs. 579, 589, 592). So the earth goes around the sun once in a year and its axis is all the time inclined in one direction. Hence during part of each year the North Pole is turned a little away from the sun, and the South Pole toward the sun:

and during another part of the year the North Pole is turned a little toward the sun, and the South Pole away from the sun.

573. The Solar System.—The earth is not the only body that revolves around the sun. There are seven other large bodies, and many smaller bodies, of the same kind, and these with the earth are called *planets*. The planets shine because the light of the sun is reflected from them, for they are not, like the sun and stars, balls of hot and glowing substances. Two of the large planets, Mercury and Venus, are nearer the sun than the earth, and hence go around the sun in smaller orbits and in shorter time. They are also smaller than the earth.

The other five large planets are Mars, Jupiter, Saturn, Uranus, and Neptune. They are all farther from the sun than the earth is, and hence move around the sun in larger orbits. All except Mars are much larger than the earth.

All the planets spin, or rotate, on their axes. Some turn in less than one of our days, and others turn so slowly that many days are required to complete a rotation. Some of the planets require a period equaling many years to finish a revolution in their orbits around the sun.

Some of the planets have small bodies that revolve around them. Our earth has one, the moon. Such smaller bodies, revolving around the planets as the planets revolve around the sun, are called *satellites*. The planet Saturn has ten satellites.

All these bodies, the sun, the planets, and the satellites, make up the solar system, that is, the family of spheres or bodies that belong with the sun.

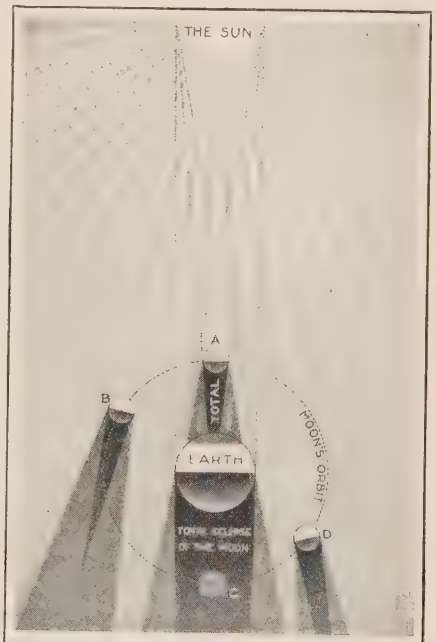

Fig. 586. Eclipses of sun and moon

There are many millions of stars in the heavens and they are much farther from us than any part of the solar system. Some of them are much larger than our sun. Each of the stars is a sun and may have many planets of its own, which are too far away to be seen through a telescope.

574. The Moon.—The moon is the earth's satellite. It revolves around the earth at a distance of about 240,000 miles. The period of revolution is a little less than a month. It also turns once around on its axis in the same period of time. The result is that we have always the same face of the moon toward us.

The moon shines because the sun's light is reflected from it to us. When it is between us and the sun its dark side is toward us. When it passes a little beyond this point, we see it as a narrow curved band of light, and call it the *new moon*. The belt of light increases until the moon is *full*. It then shows an entire half lighted because it is on the opposite side of the earth from the sun.

The moon has a rough and rocky surface, but it has no atmosphere, no soil, and no plants or animals. The attraction which it exerts on the waters of the earth is the main cause of the tides (Sec. 352), and it gives useful light during some of the evenings of each month.

When the moon comes exactly between us and the sun, it shuts off part or all of the sun from view. This is an *eclipse* of the sun, which is either *partial* or *total* (Fig. 586, A). When the earth comes exactly between the sun and the moon, it shuts off the light from the moon, and thus causes an eclipse of the moon (Fig. 586, C).

575. Time.—The rotation of the earth through one full turn takes 24 hours, or a day. This is one unit for measuring time.

One full revolution of the earth about the sun requires a few hours more than 365 days, and affords a natural measure for the period that we call one year. Both the rotation and the revolution of the moon require nearly a month, and furnish another natural division of time.

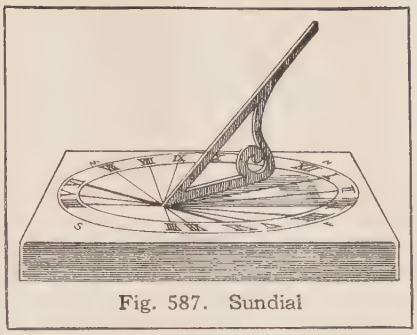

Fig. 587. Sundial

For centuries, many ingenious devices have been made for showing the time by the position of the sun, and the shadow that it casts. Such a device is called a sundial (Fig. 587). In the old days hourglasses were used for measuring time. They were so arranged that a given amount of sand would run from one part of a glass to another through a narrow neck in a given time, usually one hour. Now watches and clocks are commonly used. They are machines that cause one hand, the hour hand, to go around a dial in twelve hours, while the minute hand goes around in one hour. Thousands of regulator clocks are set to true time every day, by a telegraphic signal sent from Washington, D. C., at noon to all parts of the United States.

576. Standard Time.—As it is noon in any place when the sun is highest in the sky, local time is different for all places of different longitude. When it is noon in Greenwich, it is afternoon at all places east of Greenwich, and before noon at all places west of Greenwich. Trains have to be run on schedule time so that they may keep from collision, and so that all may know when they are due to arrive at a given place, or to depart from it. It would be difficult to do this if local, or sun, time were used in every place through which the road runs. Hence it is agreed to use *standard time*. In the United States, for a distance of about $7\frac{1}{2}°$ both east and west of the meridian of 75° west longitude, the people use the local time of that meridian. Similarly, the local time of the meridians of 90°, 105°, and 120° is used. These belts of about $7\frac{1}{2}°$ on each side of a meridian, making about 15° in all, are called *standard time belts*. In going west on a through train, the watch is put back an hour every time we pass from one belt to another. In going east the watch is in like manner put ahead one hour. The time belts in the United States have eastern, central, mountain, and Pacific time.

In practice, the belts are in places less or more than 15° wide, as seen in Figure 588.

577. International Date Line.—If we go around the world by ship, or by ship and train, each day, as marked by the sun, is a little longer or shorter than 24 hours. If we go east, we meet the sun, and it requires less than 24 hours to go from noon of one

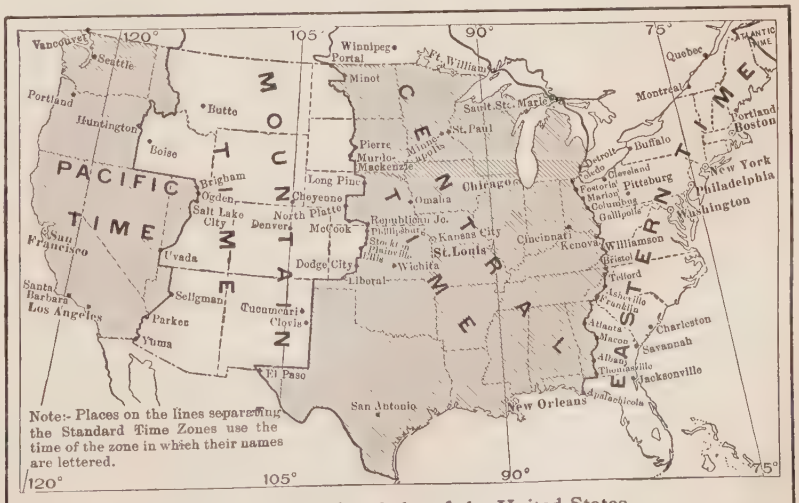

Fig.588. Standard time belts of the United States

day to noon of the next. In going entirely around the world we should thus reckon one day too many to correspond with the actual days of 24 hours each. If we go around the world to the west, we are going away from the sun, and when it overtakes us at noon, we have gone a little more than 24 hours since the sun marked noon for us the day before. We should thus reckon one day too few in a journey around the world.

Hence the nations have agreed to adopt the meridian of 180° as an *International Date Line*. A ship crossing this line to the east goes back one day in its calendar, while a ship crossing it to the west goes ahead one day. The line is chosen in the Pacific Ocean because the changes in time would be inconvenient if made on land where many people live. (See Fig. 360.)

578. The Zones.—In studying the zones refer constantly to Figure 589, which shows the June position of the earth in relation to the sun in *A*, and the December position in *B*. The two positions of the earth's axis are parallel to each other. For convenience, the sun is represented as small, while in reality it is vastly larger than the earth (Sec. 571). It is also shown as near, though it is really very far away. In *A* the inclination of the earth's axis to the plane of the orbit causes the North Pole, on June 21, to be turned $23\frac{1}{2}°$ directly toward the sun. Hence a ray of light from the sun, *a*, shines $23\frac{1}{2}°$ beyond the pole. This is the position of the Arctic Circle.

The ray of light *c* falls on the earth vertically at an angle of 90° with the surface, and the latitude at which it falls determines the position of the Tropic of Cancer, which is $23\frac{1}{2}°$ from the Equator. The ray *f* reaches a point $23\frac{1}{2}°$ from the South Pole. This is the position of the Antarctic Circle.

In *B*, representing the earth December 21, or six months later, the ray of light *g* reaches the Arctic Circle. The ray *j* is vertical $23\frac{1}{2}°$ south of the Equator and thus determines the position of the Tropic of Capricorn. The ray *l* shines $23\frac{1}{2}°$ past the South Pole, as in *A* ray *a* shines $23\frac{1}{2}°$ past the North Pole.

All the surface north of the Arctic Circle we call the Arctic, or North Frigid, Zone. The belt between the Arctic Circle and the Tropic of Cancer is the North Temperate Zone. The belt between the Antarctic Circle and the Tropic of Capricorn is the South Temperate Zone. All the surface south of the Antarctic Circle is the South Frigid Zone. The belt between the two Tropics is the Torrid Zone, divided into halves by the Equator. The sun shines either very obliquely or not at all in the Frigid Zones, and they are very cold. It shines less obliquely on the Temperate Zones, and they have a moderate amount of heat. It is always directly overhead somewhere within the Torrid Zone, and hence this zone is hot.

579. Summer and Winter.—On June 21 the North Pole is turned more toward the sun than at any other time (Fig. 589). The South Pole is turned more from the sun than at any other time. The sun's rays fall everywhere in the North Frigid Zone. In the North Temperate Zone the rays at noon are from 47° to 90° above the horizon. They are vertical at the Tropic of Cancer, and at the Equator they are $66\frac{1}{2}°$ above the horizon, or $23\frac{1}{2}°$ north of the zenith, the point directly overhead. Hence the whole Northern Hemisphere is then warm, and has its summer. At the same time no sunlight falls in the South Frigid Zone, the sun's rays fall very obliquely on the South Temperate Zone, and the Southern Hemisphere has winter. The summer (Northern Hemisphere) is warmer also because it has long days and short nights, and the winter (Southern Hemisphere) is colder because it has short days (Sec. 580).

On December 21 these conditions are exactly reversed, as shown in *B*. The sun's rays fall obliquely, and the days are short, in the Northern Hemisphere, and hence it has winter. On that date, the sun does not shine anywhere north of the Arctic Circle. At the

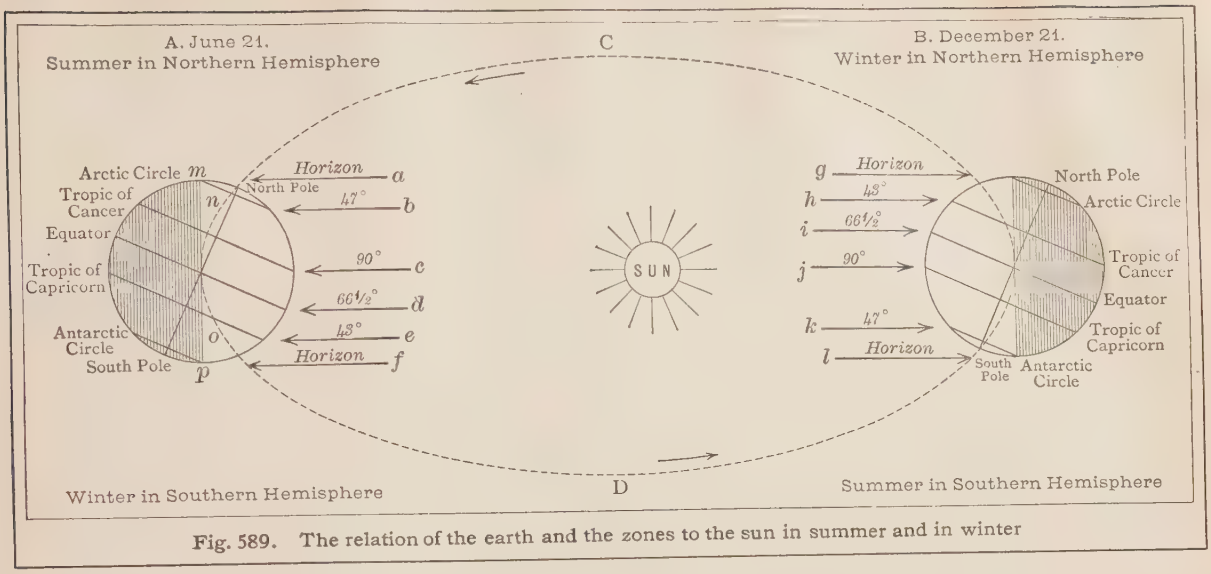

Fig. 589. The relation of the earth and the zones to the sun in summer and in winter

same time, in the Southern Hemisphere the sun rises high in the sky and the days are long. Hence that hemisphere then has its summer. On December 21, the sun shines everywhere south of the Antarctic Circle.

580. Day and Night.—Figure 589 illustrates the different lengths of day and night. A person at the Equator would be in the sunlight during half of one rotation of the earth, and in the shadow during one half a rotation. Hence day and night there would be equal. In the Northern Hemisphere in summer (*A*, Fig. 589) daylight everywhere lasts longer than darkness. A person living at *n*, for example, and going around with the earth as it turns on its axis, is longer in the sunlight than in the shadow. A person at *m*, on the Arctic Circle, would be in daylight for the full period of rotation, or 24 hours, and he would see the sun at midnight, on the horizon in the north. This is the "midnight sun," which many people go to North Cape in Norway to see. Within the Arctic Circle, daylight is everywhere long in summer, and at the North Pole there is daylight for six months, or while the earth is passing from *C* around to *D*; that is, from March 21 to September 22 (Fig. 592).

During this period south of the Equator the night is everywhere longer than the day, for winter there is at the same time as summer in the Northern Hemisphere. A person at *o* (Fig. 589) is longer in the shadow than in the sunlight, as the earth turns. At *p*, on the Antarctic Circle, one would see the sun on the horizon at noon in the north, but it would be night all the rest of the 24 hours. Within the Antarctic Circle night everywhere is long in winter, and at the South Pole it lasts six months.

Near the Arctic Circle the summer is cool and short, because the sun's rays are very oblique, and less heat comes through the atmosphere to the ground. But the days are very long, and the nights short. For this reason vegetables, grasses, and even hardy grains may ripen during the short summer.

Referring now to *B* in Figure 589, we can see that the conditions of day and night are reversed. It is now winter in the Northern Hemisphere, and the days are shorter as we go north, until at the Arctic Circle the sun is seen only at noon, on the southern horizon. The night lengthens as we approach the Pole, where it lasts six months.

The Southern Hemisphere is in its summer and has daylight increasing from a period of twelve hours at the Equator to six months at the South Pole.

ARCTIC OCEAN
Greenland
Alaska
Arctic Circle
Iceland
Scandinavia
Siberia
NORTH AMERICA
Dominion of Canada
British Isles
Germany
Russia
ASIA
France
Austria
Spain
Italy
Turkey
United States
ATLANTIC OCEAN
Japan
China
Persia
Egypt
Arabia
Tropic of Cancer
Mexico
West Indies
Sahara
India
Hawaii
PACIFIC OCEAN
Central America
Equator
Heat
Sudan
AFRICA
Philippine Islands
Ceylon
SOUTH AMERICA
Brazil
Kongo
East Indies
INDIAN OCEAN
Tropic of Capricorn
Madagascar
AUSTRALIA
Argentina
New Zealand
Falkland Is.
South Georgia
Kerguelen Island
South Shetland
ANTARCTIC OCEAN
Antarctic Circle
Wilkes Land
Fig. 590
MEAN ANNUAL TEMPERATURE
(By A. Buchan)
OVER 80°
70° TO 80°
50° TO 70°
30° TO 50°
0° TO 80°
BELOW 0°
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ARCTIC OCEAN
NORTH COLD CAP
Greenland
Alaska
Arctic Circle
Iceland
Scandinavia
Siberia
NORTH TEMPERATE BELT
Dominion of Canada
British Isles
Germany
Russia
ASIA
France
Austria
Spain
Italy
Turkey
United States
ATLANTIC OCEAN
Japan
China
Persia
Egypt
Arabia
Tropic of Cancer
Mexico
West Indies
Sahara
India
Hawaii
PACIFIC OCEAN
Central America
Equator
Heat
Sudan
AFRICA
Philippine Islands
Ceylon
HOT BELT
SOUTH AMERICA
Brazil
Kongo
East Indies
INDIAN OCEAN
Tropic of Capricorn
Madagascar
AUSTRALIA
SOUTH TEMPERATE BELT
Argentina
New Zealand
Falkland Is.
South Georgia
Kerguelen Island
SOUTH COLD CAP
South Shetland
ANTARCTIC OCEAN
Antarctic Circle
Wilkes Land
Fig. 591
HEAT BELTS
(By A. Supan)
HOT BELT. Above 68° mean annual temperature
TEMPERATE BELTS
COLD CAPS. Where every month averages below 60°
COPYRIGHT, BY AMERICAN BOOK COMPANY
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581. Spring and Autumn.—In Figure 592 we imagine that we see the sun and the earth's orbit from such a position that we observe the North Pole, and the earth in its position for each month. The position for June 21 corresponds to *A* in Figure 589, but now we look down on the North Pole, while in *A* we look across it. In like manner, the position for December 21 corresponds with *B* in Figure 589.

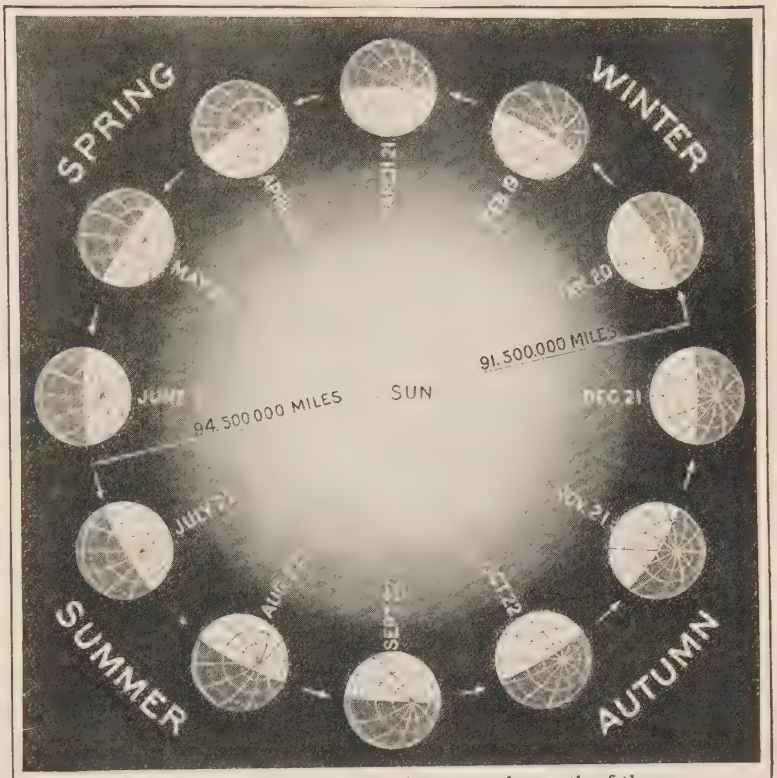

Fig. 592. Earth in relation to the sun each month of the year

Look now at the earth as it is related to the sun on March 21. The North Pole is not turned at all toward the sun, and the South Pole is not turned toward it. The sun's rays reach both poles, though we see only one in the diagram. At this time all people on earth, wherever they may be, have day and night of equal length; each is twelve hours long. Hence this date is called the *equinox*, or the time when night equals day. As the season is spring, this is the *spring*, or *vernal*, equinox.

Look now at the diagram for September 22. The conditions are the same as for March 21, and we call the time the *autumnal* equinox.

By looking at other parts of the diagram we can see that the days in the Northern Hemisphere are longer as we are nearer June, and the nights are longer as we are nearer December.

MEAN ANNUAL TEMPERATURE AND HEAT BELTS

582. Mean Annual Temperature.—Among the facts shown by the daily weather maps issued by the Weather Bureau of the national government none are more interesting than the records of temperature and the changes which they show for each place from day to day. On such maps the influence of elevation upon temperature is very clearly shown. In studying the causes which lead to temperature differences on land and sea, as well as for other purposes, it is often desirable to know what the temperature of all places would be if they were at sea level. This is usually found by adding to the temperature as recorded by the thermometer one degree for every three hundred feet of elevation.

It is sometimes desirable also to be able to compare the average temperatures of places for a month or year or for a much longer time.

Figure 590 is a map of the kind described; it shows sea level temperatures, as averaged for a long period of years.

583. Heat Belts.—As we have seen (Sec. 578), the boundaries of the zones are fixed by the way the sun shines at different places and at different times. The zones are really light zones, although named as if they were

heat zones. The distribution of heat, as shown by Figure 590, is affected by winds and other causes besides sunshine.

Figure 591 shows the true heat belts, corresponding in a rough way with the zones. The hot belt is bounded by lines of mean annual temperature; but the temperate belts extend poleward to the line of 50° average temperature for the hottest month.

The hot belt is on both sides of the Equator, but more in the Northern Hemisphere than in the Southern. The north temperate belt is much broader than the south temperate belt and more irregular in outline; it includes nearly half of the land surface of the earth. The temperate belts include some regions of mild temperature and some regions of cold winters and warm summers. In them live the progressive peoples of the world.

We began the studies of this book with the ways of living in the cold north, in the heated tropics, in temperate latitudes, and in desert regions. We have now seen in this chapter that these ways of living depend in great part upon the relations which our earth bears to the sun. The sun makes life on the earth possible and it shapes in many ways the lives of plants, animals, and men.

Review.—1. How large is the earth? 2. How much shorter is the polar diameter than the equatorial? 3. Give reasons for thinking that the earth is nearly a sphere. 4. What is meant by gravitation? What results from it?

5. By what is the earth surrounded? 6. Describe the earth's surface.

7. Define the axis of the earth; the poles. 8. What are the cardinal points? 9. Where is the North Magnetic Pole? 10. What is meant by the variation of the magnetic needle?

11. What is latitude? What is a parallel of latitude? 12. How long is a degree of latitude? 13. What is longitude? What is the prime meridian? 14. How does the length of a degree of longitude vary?

15. Compare the size and weight of the sun with those of the earth. 16. What is the earth's orbit? What is the shape of the orbit? 17. How much is the earth's axis inclined?

18. What is the solar system? 19. What planets are nearer than the earth to the sun? 20. What are satellites?

21. How far is the moon from the earth? 22. How does the moon differ from the earth? 23. How is an eclipse of the moon caused?

24. How do we get the length of our day? 25. What is local time? 26. Define standard time. What names are given to the standard time belts in the United States? 27. What is the International Date Line?

28. What determines the position of the Arctic and Antarctic Circles? Of the Tropic of Cancer? The Tropic of Capricorn? 29. Name the zones.

30. What causes summer in the Northern Hemisphere? 31. What part of the earth has summer about December 21?

32. Why are summer days longer than winter days? 33. What makes it possible to raise some crops in regions far north, where summer is very short? 34. What is the "midnight sun"? 35. What places have day and night six months long?

36. What are the equinoxes? 37. What seasons occur at the time of the equinoxes?

38. Make from memory a sketch map of North America, including the following features: Great Lakes; Mississippi, Colorado, Columbia, Nelson, Mackenzie, and Yukon river systems; Montreal, Vancouver, Seattle, San Francisco, Chicago, New Orleans, New York, Philadelphia, and Washington.

39. Make a sketch map of Europe and include five important rivers, seven national capitals, and the following mountain ranges: Alps, Pyrenees, Apennines, Carpathians. 40. Name the largest island of Europe and the largest island in the temperate latitudes of North America, and compare them as to latitude, area, climate, population, and products.

41. Make a sketch map of your own state, including the capital, the chief cities, your home town, the chief rivers, and leading agricultural and manufactured products. 42. Name the European country whose area is approximately equal to that of your own state. 43. Compare the areas of Massachusetts and Belgium; of Colorado and the British Isles; of Texas and France.

44. Name five important agricultural countries; four important manufacturing countries. 45. What important imports do we receive from South America? What are our leading exports to Europe? 46. Name four important seaports in the United States, two in South America, one in Australia, three in Asia, one in Africa, and seven in Europe.

REVIEW OF IMPORTANT PRODUCTS

WHEAT

(Five-year averages)

World's annual production, 3,265,000,000 bushels.

Leading wheat-growing countries, with percentages of the world crop:

United States	26%
India	10%
Canada	10%
France	8%
Argentina	3%

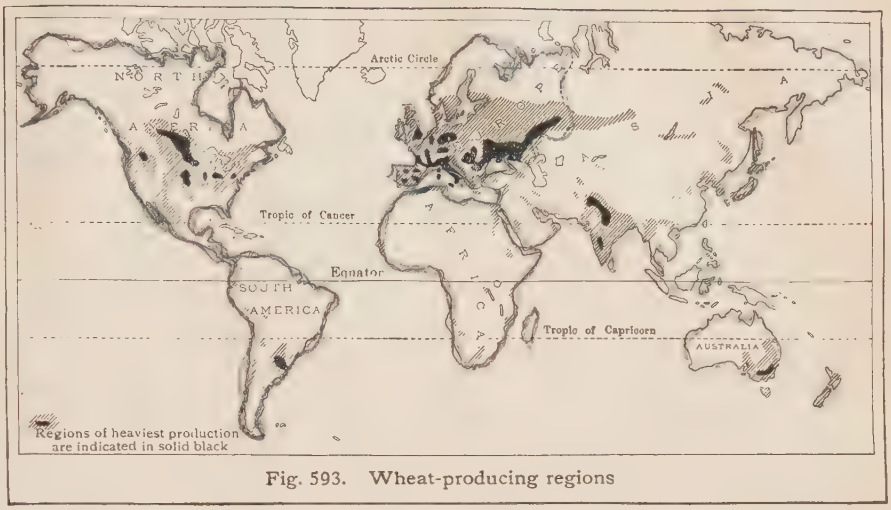

Fig. 593. Wheat-producing regions

Average annual production in the United States, 854,000,000 bushels.

Leading wheat-growing states, with percentages of United States crops:

Kansas	15%	Nebraska	6⅓%
North Dakota	9½%	Washington	5½%
Illinois	6½%	Oklahoma	5½%

Leading wheat-exporting countries: United States, Argentina, Canada.

Reading References.—Sections 182–186, 108, 252, 292, 326, 492 of this book. Carpenter's "How the World is Fed" (American Book Company). Smith's "The World's Food Resources" (Holt). Rutter's "Wheat Growing in Canada, the United States, and the Argentine" (Macmillan Company). Whitbeck's "Industrial Geography" (American Book Company).

CORN

(Five-year averages)

World's annual production, 4,130,000,000 bushels.

Leading corn-growing countries, with percentages of the world crop:

United States	73%
Argentina	5%
Rumania	3½%
Italy	2½%
British Indies	2%
Yugoslavia	2%

Average annual production of corn in the United States, 3,010,000,000 bushels.

Leading corn-growing states, with percentages of United States crop:

Iowa	14⅔%	Indiana	6%
Illinois	10½%	Ohio	5⅓%
Nebraska	7⅓%	Minnesota	4½%
Missouri	6%	Texas	4⅓%

Leading corn-exporting countries: Argentina, United States.

Reading References.—Sections 187, 190, 110, 326. Carpenter's "How the World is Fed," pp. 44–55. Brooks's "The Story of Corn and the Westward Migration" (Rand, McNally & Co.). Myrick's "Book of Corn" (Judd).

Fig. 594. Corn-producing regions

RICE

(Five-year averages)

World's annual production, 175,000,000,000 pounds.

Leading rice-growing countries, with percentages of world crop:

India 38%
China (estimated) 30%
Japanese Empire 15%

The United States produces less than one per cent of the world total, although the production has considerably increased in recent years.

Leading rice-exporting countries, with percentages of the world's exports of rice:

India 32%
French Indo-China 26%
Siam 17%

Leading rice-growing states in the United States: Louisiana, Texas, Arkansas, California.

Reading References.—Sections 165, 468, 515, 523, 529. Carpenter's "How the World is Fed," pp. 56–66. R. H. Whitbeck's "Industrial Geography"—see index for various countries (American Book Company). Freeman and Chandler's "The World's Commercial Products," pp. 27–49 (Ginn & Co.). King's "Farmers of Forty Centuries" (Mrs. F. H. King, 1540 University Ave., Madison, Wisconsin).

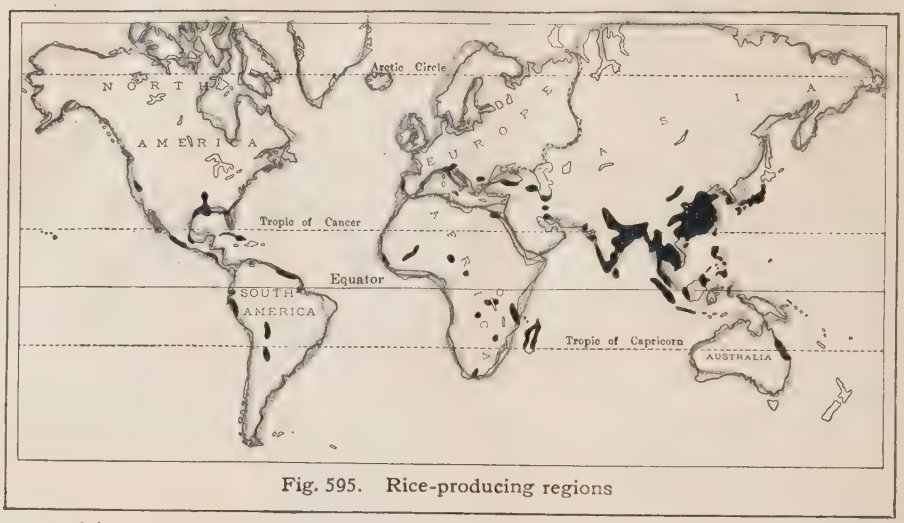

Fig. 595. Rice-producing regions

SUGAR

(Five-year averages)

World's annual crop:

Cane . 3,700,000 tons
Beet . 5,600,000 tons

Leading cane-sugar countries, with percentages of the world's cane-sugar crop:

Cuba 31%
India 23%
U. S. and dependencies . . . 9%
Java 14%

Leading beet-sugar countries are Germany, Czechoslovakia, France, Poland, Italy, Russia, Netherlands, and Belgium. Great Britain imports much beet sugar from the Continent.

The crop of cane sugar in the main body of the United States, of which the state of Louisiana produces the greater part, averages over 200,000 tons a year. This is about $1\frac{2}{3}\%$ of the world's total.

The leading beet-sugar states, with percentages of United States production, are Colorado 27%, California 15%, Utah 15%, Michigan 14%.

Reading References.—Sections 164, 422. Surface's "Story of Sugar" (Appleton). Carpenter's "How the World is Fed," pp. 328–345. Whitbeck's "Industrial Geography." Wiles's "Cuban Cane Sugar" (Bobbs-Merrill Co.). Geerligs's "The World's Cane Sugar Industry" (Van Nostrand Co.).

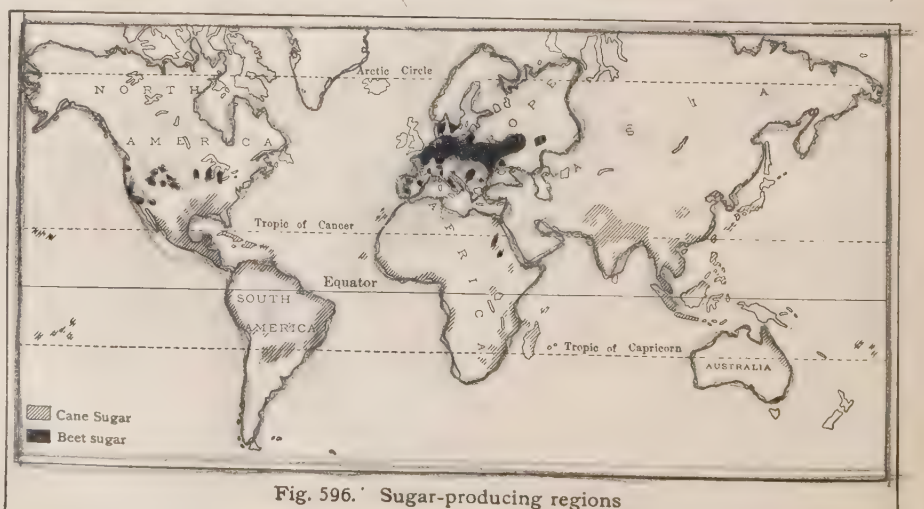

Fig. 596. Sugar-producing regions

TEA

(Five-year averages)

The total production of tea in some countries is not reported. The world's annual *exports* of tea amount to 728,000,000 pounds.

Leading tea-exporting countries, with percentages of the world's exports of tea:

India	46%
Ceylon	25%
Dutch East Indies	12%
China	9%
Japan, etc.	6%

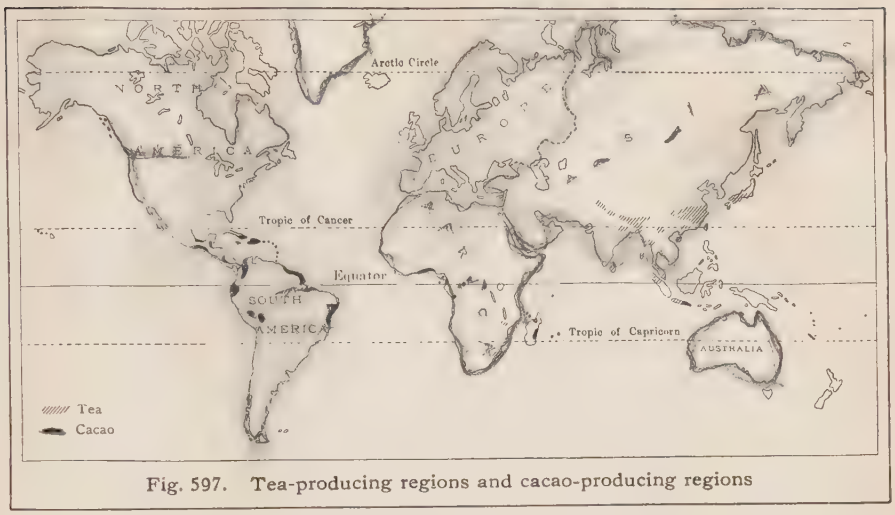

Fig. 597. Tea-producing regions and cacao-producing regions

Among the leading tea-consuming countries Australia uses each year about seven pounds per person, Great Britain six pounds, and Canada four pounds. The United States uses somewhat less than one pound per inhabitant.

Reading References.—Sections 515, 521, 530. Carpenter's "How the World is Fed," pp. 308–316. Whitbeck's "Industrial Geography," consult index. Ibbetson's "Tea from Grower to Consumer" (Sir Isaac Pitman and Sons).

COFFEE (Five-year averages)

World's annual production, about 2,500,000,000 lbs. (Fig. 334); annual exports, 2,300,000,000 lbs.

Leading coffee-exporting countries, with percentages of the world's exports of coffee:

Brazil	67%
Central America	9%
Colombia	5%
Dutch East Indies	4%
Venezuela	2½%

Among coffee-importing countries the United States leads, taking nearly half of the world crop. France is next, taking about one fourth as much as we do. Germany uses much coffee. Belgium and Netherlands are large consumers in proportion to their population.

Reading References.—Section 321. Carpenter's "South America" (American Book Company). Keable's "Coffee from Grower to Consumer" (Sir Isaac Pitman and Sons).

CATTLE

The world's total is about 580,000,000. The leading cattle-raising countries are:

India	25%	Italy	6%
United States	12%	Germany	3%
Argentina	6%	China	3%
Brazil	6%	Russia in Asia	3%
European Russia	5%	France	2%

Reading References.—Sections 192–196, 326. Carpenter's "North America," pp. 252–258 (American Book Company). Brigham's "Commercial Geography," pp. 40–57 (Ginn & Co.).

Fig. 598. Cattle-raising regions

COTTON

(Five-year averages)

World's annual production, 19,000,000 bales of 500 pounds each.

Leading cotton-growing countries, with percentages of world production:

United States	58%
India	20%
China (estimated)	11⅔%
Egypt	5⅔%

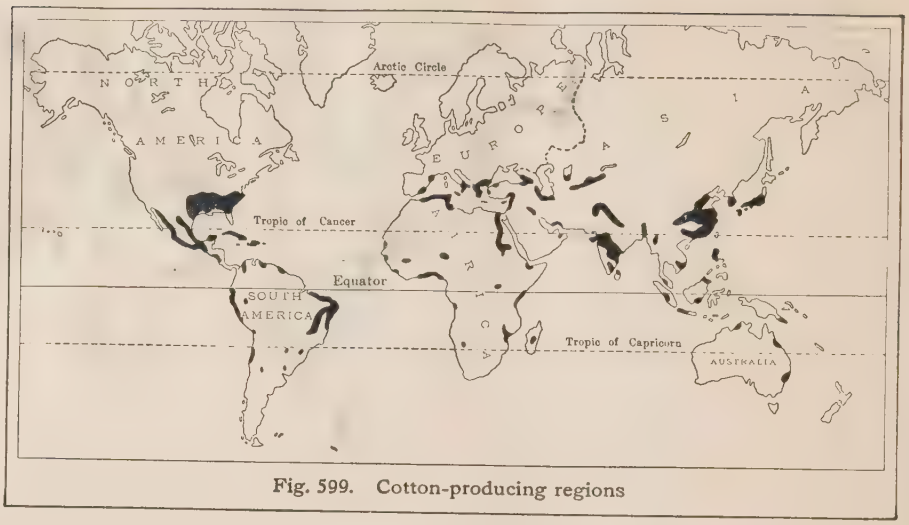

Fig. 599. Cotton-producing regions

World's annual imports, about 11,000,000 bales, of which Great Britain takes about one fourth, Japan about one fifth, and Germany and France about one tenth each. Belgium and Italy also import much cotton.

Average annual cotton production of the United States, 11,000,000 bales.

Leading cotton-producing states, with percentages of United States crop:

Texas	31%	Mississippi	8%
Georgia	9%	Arkansas	8%
South Carolina	9%	Oklahoma	8%
North Carolina	8%	Alabama	6%

Reading References.—Sections 88, 141–143, 163, 412, 550. Carpenter's "How the World is Clothed" (American Book Company). Chamberlain's "How We are Clothed" (Macmillan Co.). Bigwood's "Cotton" (Holt). Scherer's "Cotton as a World Power" (F. A. Stokes Co.).

WOOL

(Five-year averages)

Annual *exports* of wool reported from all countries, 1,850,000,000 pounds.

Leading wool-exporting countries, with percentages of exports reported for all countries:

Australia	36%
Argentina	17%
New Zealand	11%
British South Africa	11%
Uruguay	5½%

Among the wool-importing countries Great Britain leads, taking about one third, France takes nearly one fourth, the United States about one fifth, and Germany more than one seventh. Belgium is a heavy importer of wool.

These statements are based on abnormal conditions of the wool trade after the World War.

Leading wool-producing states, with percentages of the United States production:

Wyoming	9%	Ohio	6%
Texas	8%	Oregon	6%
Idaho	7½%	Colorado	6%
Montana	7%	New Mexico	5%
Utah	7%		

Reading References.—Sections 226, 89, 413, 560. Carpenter's "How the World is Clothed," pp. 73–90. Ormerod's "Wool" (Holt).

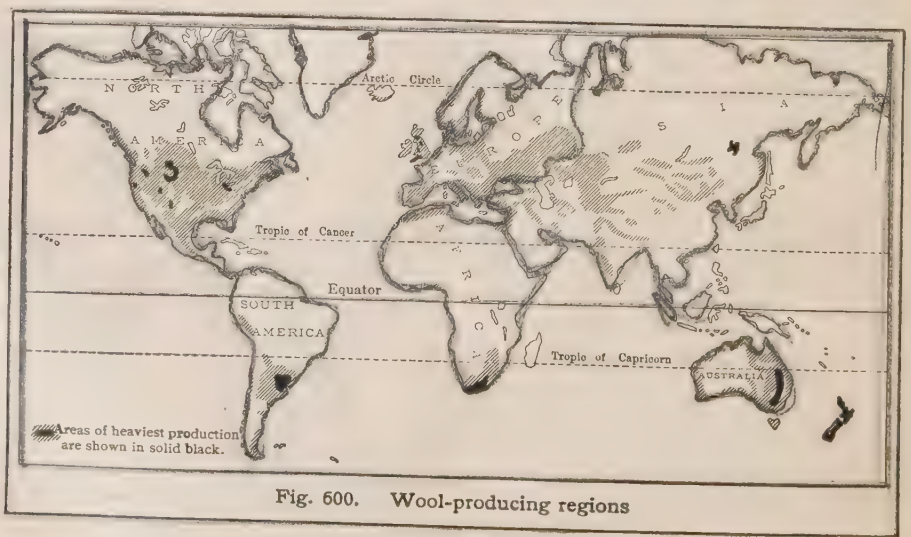

Fig. 600. Wool-producing regions

RAW SILK

(Five-year averages)

It is impossible to obtain accurate figures of the world production of raw silk, as the records of production in the Oriental countries are not complete. In the following table, therefore, the figures for Japan and China are for exports only.

World's annual production approximates 72,000,000 pounds.

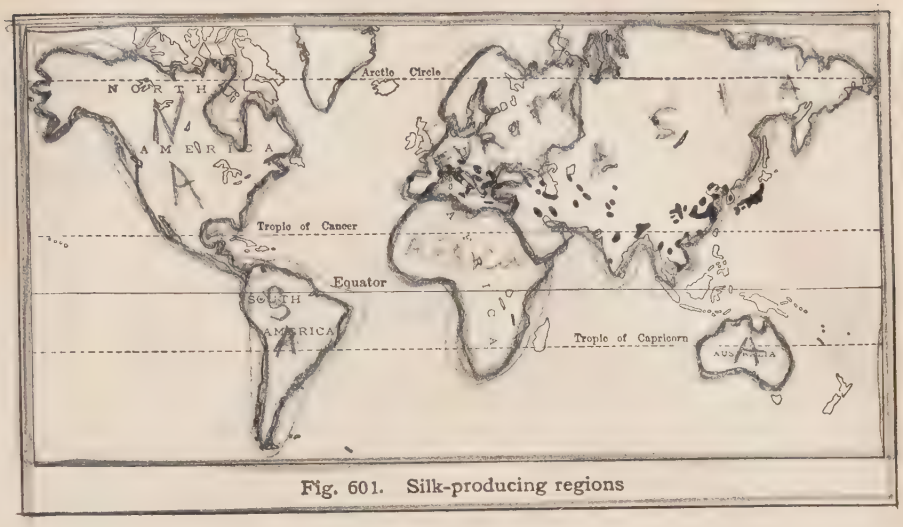

Fig. 601. Silk-producing regions

Leading silk-producing countries, with percentages of the world average given above:

Japan	47%
China	20%
Italy	9%

These three countries lead also in the exportation of raw silk to the United States.

Leading countries exporting manufactured silk to the United States: France, Japan, Switzerland, Great Britain, Italy, and China.

Reading References.—Sections 449–469, 529. Carpenter's "Asia," pp. 50–52 (American Book Company). Carpenter's "How the World is Clothed," pp. 105–127 (American Book Company).

RUBBER (Five-year averages)

World's annual production, 800,000,000 pounds.

Leading sources of rubber, with percentages of world production:

Plantation	88%
Brazil	7½%
Other sources	4½%

Most of the world's rubber is now grown on plantations in the far East. Plantations have been developed in the Federated Malay States, in the Straits Settlements, and in Java, Sumatra, Ceylon, southern India, Borneo, and Dutch and British Guiana. Some rubber is also produced in west and central Africa, Philippine Islands, and Trinidad.

Leading rubber-importing countries (chiefly for home consumption). Three-year averages:

United States	550,000,000 pounds
Great Britain	110,000,000 pounds
France	57,000,000 pounds
Germany	47,000,000 pounds
Japan	34,000,000 pounds
Netherlands	27,000,000 pounds

Reading References.—Section 322. Carpenter's "South America," pp. 312–320. Carpenter's "How the World is Clothed," pp. 240–261. Freeman and Chandler's "The World's Commercial Products," pp. 278–297. Lock's "Rubber and Rubber Planting" (Cambridge University Press).

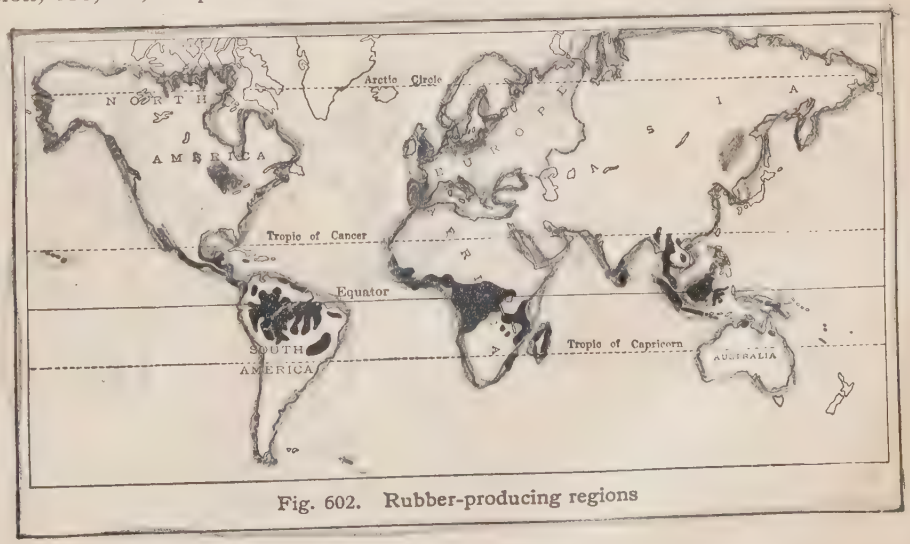

Fig. 602. Rubber-producing regions

FLAX (FIBER)

The greater part of the world's flax fiber is grown in Europe. Before the World War, about 80% of the world's flax fiber was grown in European Russia. Another region of production is in Belgium, Netherlands and northern France. A third center is in the north of Ireland.

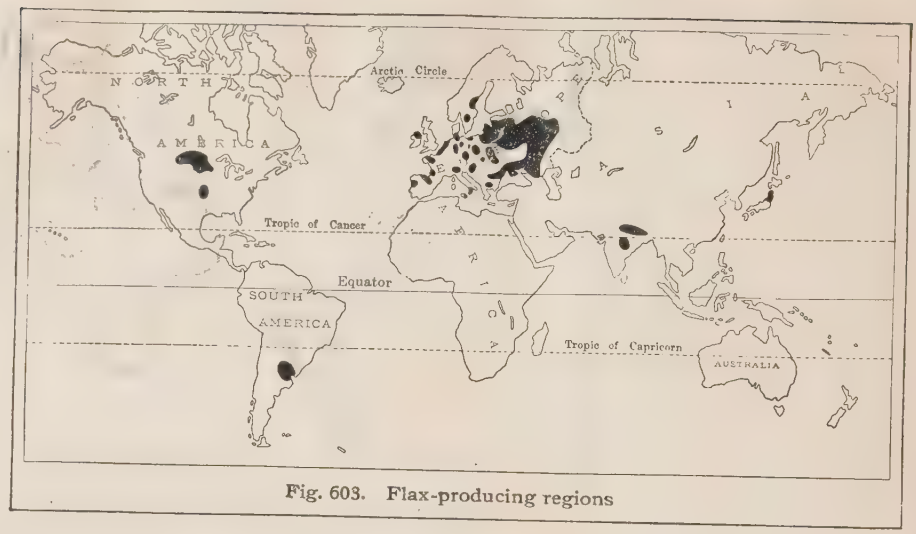

Fig. 603. Flax-producing regions

FLAXSEED

(Five-year averages)

World's annual production, 110,000,000 bushels.

Countries leading in the production of flaxseed, with percentages of world production:

Argentina	22%	United States	18%
India	20%	Canada	12%
Russia	about 20%		

Average annual production of flaxseed in United States, 10,770,000 bushels.

Leading flax-growing states, with percentages of United States production:

North Dakota	46%	South Dakota	17%
Minnesota	33%	Montana	8%

Reading References.—Sections 189, 399, 418, 489, of this book. Carpenter's "How the World is Clothed," pp. 50–59. Freeman and Chandler's "The World's Commercial Products," pp. 313–315.

COAL

World's annual production, 1,350,000,000 short tons.

Leading coal-producing countries, with percentages of world production:

United States	43%
Great Britain	21%
Germany	about 14%
France	about 3%
Poland	$2\frac{2}{3}$%

Of the coal mined in the United States (580,000,000 short tons), only 85,000,000 tons, or less than 15%, is anthracite, and of this amount the state of Pennsylvania produces over 99%.

Leading coal-producing states, with percentages of United States production:

Pennsylvania	40%	Kentucky	6%
West Virginia	$15\frac{2}{3}$%	Indiana	4%
Illinois	13%	Alabama	3%
Ohio	6%		

Reading References.—Sections 111, 112, 169, 411. Martin's "Story of a Piece of Coal" (Appleton). Brigham's "Commercial Geography," pp. 79–91. Carpenter's "North America," pp. 211–218. Whitbeck's "Industrial Geography."

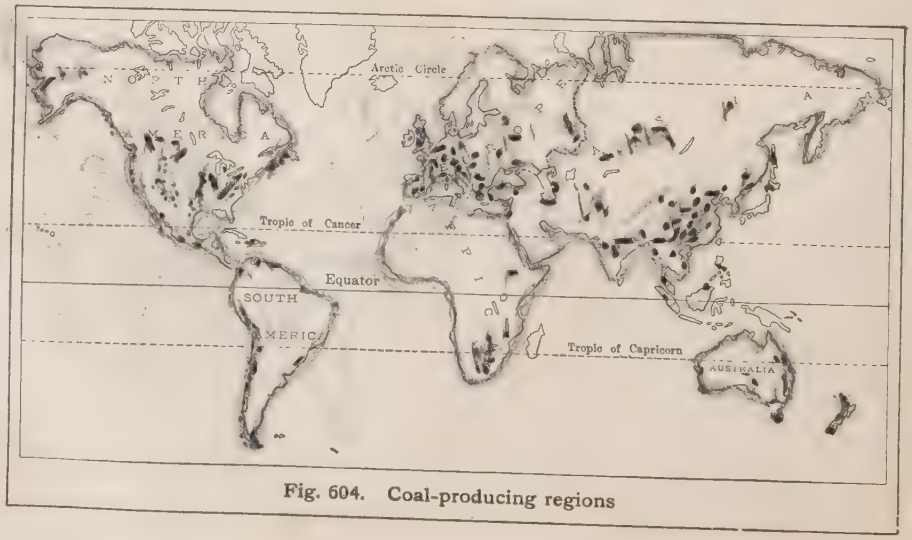

Fig. 604. Coal-producing regions

IRON

World's annual production of pig iron, 51,000,000 long tons.

Countries leading in the production of pig iron, with percentages of world production:

United States	53%
Germany	about 16%
Great Britain	10%
France	10%
Russia	6%
Czechoslovakia	3%
Belgium	3%

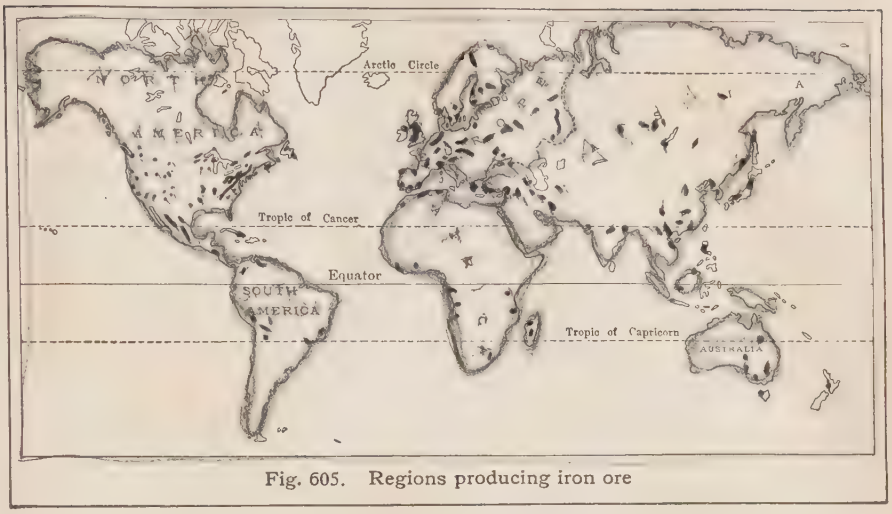

Fig. 605. Regions producing iron ore

Annual production of pig iron in the United States, 40,000,000 tons.

States leading in the production of pig iron, with percentages of United States production:

Pennsylvania	38%
Ohio	23%
Illinois	9½%
Michigan	9½%
New York	7½%
Alabama	7%

Annual production of iron ore in the United States, about 70,000,000 long tons.

States leading in the mining of iron ore:

Minnesota	63%
Michigan	20%
Alabama	10%

Reading References.—Sections 127, 5, 169, 198, 411. Smith's "Story of Iron and Steel" (Appleton). Whitbeck's "Industrial Geography," pp. 177–183. Carpenter's "How the World is Housed," pp. 142–163 (American Book Company).

COPPER

World's annual production, 2,800,000,000 pounds.

Leading copper-producing countries, with percentages of world production:

United States	51%
Chile	16%
Japan	5%
Mexico	4%
Spain—Portugal	4%
Peru	3%
Canada	3%

Annual production of copper in the United States, 1,430,000,000 pounds.

Leading copper-producing states, with percentages of United States production:

Arizona	43%
Montana	16%
Utah	15%
Michigan	10%
Alaska	5%
Nevada	4%
New Mexico	4%

Reading References.—Sections 237, 200. Carpenter's "North America," pp. 182–184. Carpenter's "How the World is Housed," pp. 180–188.

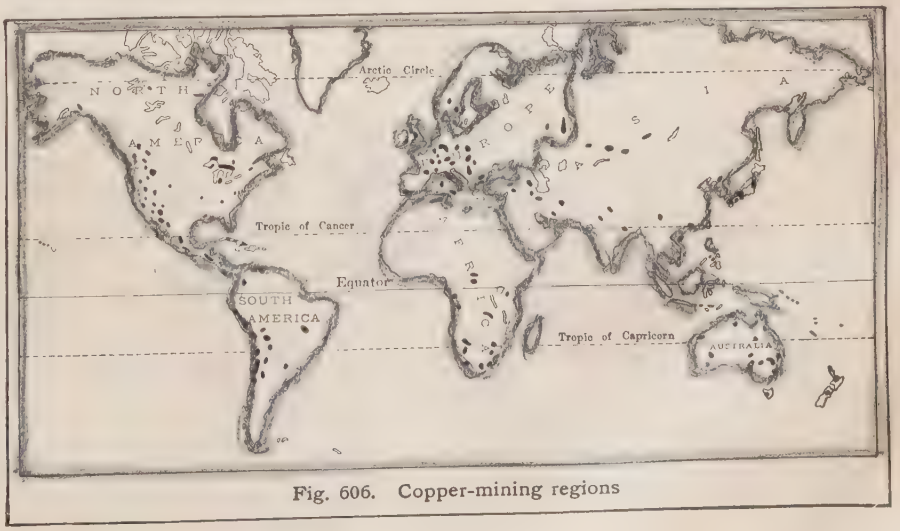

Fig. 606. Copper-mining regions

PETROLEUM

World's annual production, 775,000,000 barrels, each 42 gallons.

Leading petroleum-producing countries, with percentages of world production:

United States	67%
Mexico	20%
Russia	4%
Dutch East Indies	2%
Rumania	1⅔%
India	1%

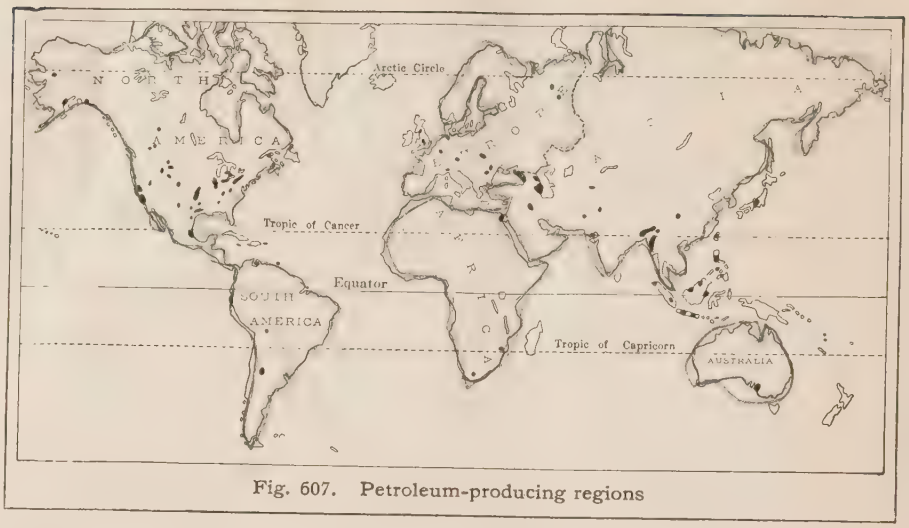

Fig. 607. Petroleum-producing regions

Petroleum production of the United States, 516,000,000 barrels a year.

Leading petroleum-producing states, with percentages of United States production:

California	28%
Oklahoma	24%
Texas	20%
Arkansas	8%
Kansas	7%
Louisiana	5%
Wyoming	5%

Reading References.—Sections 113, 171, 255, 541. Tower's "Story of Oil" (Appleton). Carpenter's "North America," pp. 203–207. Carpenter's "How the World is Housed," pp. 286–290.

GOLD AND SILVER

World's annual production of gold, $343,000,000.

Leading gold-producing regions, with percentages of world production:

Africa	54%
United States	15%
Mexico	7%
Canada	7%
Australia	6%
South America	4%
British India	2%
Japan-Chosen	2%

World's annual production of silver, $146,000,000.

Leading silver-producing regions, with percentages of world production:

Mexico	38%
United States	29%
South America	9%
Canada	8%
Asia	4%
Australasia	4%

Reading References.—Sections 235, 236, 261, 291, 556, 560. Mead's "Story of Gold" (Appleton). Carpenter's "Africa," pp. 303–309; "Australia," pp. 39–44; "North America," pp. 266–273.

General References.—Some mineral industries (notably petroleum) are subject to rapid changes because of the discovery of new fields and the decreased production of old fields, and for other reasons. Consult "Mineral Resources of the United States" (Annual, United States Geological Survey), or Roush's "The Mineral Industry" (annual, McGraw-Hill Book Company).

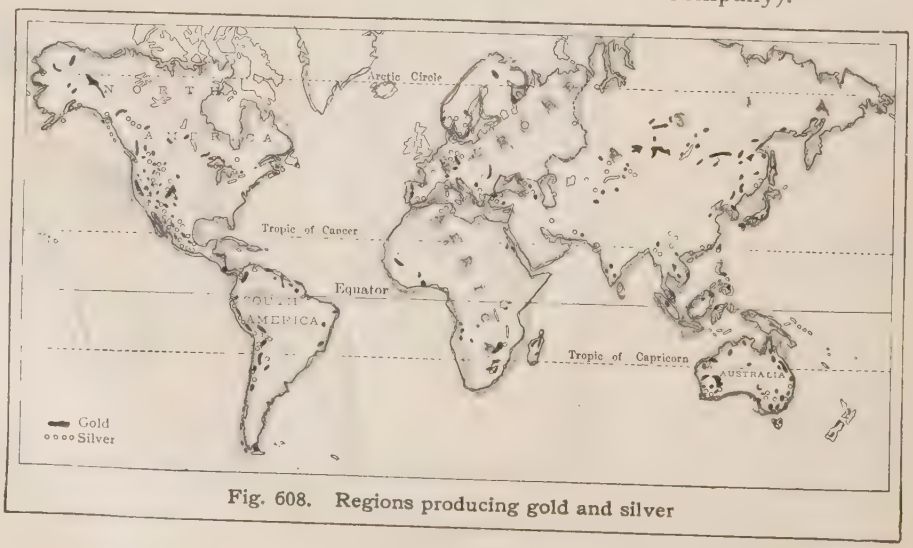

Fig. 608. Regions producing gold and silver

BOOKS FOR REFERENCE READING

The books in the following list present in greater detail many of the topics and regions treated in this textbook. They are chosen for their excellence; but some care will be necessary in assigning passages for the pupils' reading. Reference should be made to definite pages, and the children should be asked to read independently only such portions of a book as are reasonably simple and clear.

The following abbreviations are used: American Book Company, New York (A. B. C.); D. Appleton and Company, New York (D. Ap.); The Century Company, New York (Cent.); Ginn and Company, Boston (Ginn); Henry Holt and Company, New York (H. H.); Orange Judd Company, New York (Judd); J. B. Lippincott Company, Philadelphia (Lip.); The Macmillan Company, New York (Mac.); G. P. Putnam's Sons, New York (Put.); Charles Scribner's Sons, New York (Scrib.).

General. — Geographical Readers, especially suitable for the pupils' reading: Carpenter's "North America," "South America," "Europe," "Asia," "Africa," "Australia, Our Colonies, and Other Islands of the Sea" (A. B. C.). Chamberlain and Chamberlain's "North America," "South America," "Europe," "Asia," "Africa," "Australia" (Mac.).

Standard Works of Reference.—Any good modern Encyclopedia. Stanford's "Compendium of Geography and Travel," North America 2 v., Central and South America 2 v., Europe 2 v., Asia 2 v., Africa 2 v., Australasia 2 v. (Lip.). "Cyclopedia of Names" (Cent.). "The Statesman's Year-Book," an annual (Mac.). Dryer's "High School Geography" (A. B. C.). Mill's "International Geography" (D. Ap.). McFarlane's "Economic Geography" (Mac.). Smith's "Industrial and Commercial Geography" (H. H.). Talbot's "Railway Conquest of the World" (Lip.). Freeman and Chandler's "The World's Commercial Products" (Ginn). The Century "Atlas" (Cent.). Stieler's "Hand Atlas" (G. E. Stechert & Co., N. Y.). "National Geographic Magazine" (National Geographic Society, Washington, D. C.).

Sections 11–39. North America.[1] — Russell's "North America" (D. Ap.), "Rivers of North America" (Put.), "Lakes of North America" (Ginn), "Glaciers of North America" (Ginn), "Volcanoes of North America" (Mac.). Brigham's "Geographic Influences in American History" (Ginn). Semple's "American History and its Geographic Conditions" (Houghton, Mifflin & Company, Boston). Smith's "North America" (Harcourt, Brace & Co.).

40–282. The United States.[1] — Shaler's "United States of America" 3 v. (D. Ap.). Ward's "Climate" (Put.). Fiske's "How the United States Became a Nation" (Ginn). Powell's and others' "National Geographic Monographs" (A. B. C.). Dondlinger's "Book of Wheat" (Judd). Myrick's "American Sugar Industry" (Judd). Oemler's "Truck Farming at the South" (Judd). Turpin's "Cotton" (A. B. C.). Thompson's "From the Cotton Field to the Cotton Mill" (Mac.). Todd's "The World's Cotton Crops" (Mac.). Bean's "On the Wool Track" (John Lane Company, New York). Additional references on pages 403–410.

283–308. Other Countries of North America.[1] — Hayden's "Canada: Britain's Largest Colony" (Cassell, London). Bradley's "Canada" (H. H.). Enock's "Mexico" (Scrib.). Carson's "Mexico, the Wonderland of the South" (Mac.). Martin's "Mexico of the Twentieth Century" 2 v. (Dodd Mead and Company, New York).

309–335. South America.[1] — Bowman's "South America: a Geography Reader" (Rand McNally and Co., Chicago). Bryce's "South America" (Mac.). Buley's "Brazil (northern)"; "Brazil (southern)" (D. Ap.). Koebel's "Uruguay" (Scrib.). Hardy's "Paraguay" (Scrib.). Martinez and Lewandowski's "The Argentine in the Twentieth Century" (Scrib.). Elliott's "Chile" (Scrib.). Walle's "Bolivia" (Scrib.). Vivian's "Peru" (D. Ap.). Enock's "Peru" (Scrib.). Enock's "Ecuador" (Scrib.). Levine's "Colombia" (D. Ap.). Dalton's "Venezuela" (Scrib.). Rodway's "Guiana: British, French, and Dutch" (Scrib.).

336–374. The Ocean and the World Winds. — Murray's "Ocean" (H. H.). Johnson's "Ocean and Inland Water Transportation" (D. Ap.). Smith's "The Organization of Ocean Commerce" (University of Pennsylvania). Ward's "Climate" (Put.).

375–493. Europe.[1] — Lyde's "The Continent of Europe" (Mac.). Mackinder's "Britain and the British Seas" (D. Ap.). Dawson's "German Life in Town and Country" (Put.). Partsch's "Central Europe" (D. Ap.). Lynch's "French Life in Town and Country" (Put.). Deecke's "Italy" (Mac.). Drage's "Austria-Hungary" (E. P. Dutton and Company, New York). Palmer's "Russian Life in Town and Country" (Put.). Wallace's "Russia" 2 v. (Cassell, London). Leroy-Beaulieu's "Empire of the Tsars and the Russians" 3 v. (Put.).

494–563. Asia, Africa, and Australia.[1] — Holdich's "India" (D. Ap.). Hogarth's "The Nearer East" (D. Ap.). Little's "The Far East" (Oxford University Press, London). Turner's "Siberia" (Scrib.). Willis's "Agriculture in the Tropics" (Put.). White's "Development of Africa" (Philip, London). Gregory's "The Dead Heart of Australia" (Murray, London).

564–583. The Earth as a Whole. — Johnson's "Mathematical Geography" (A. B. C.).

[1] In addition to those given in the general list above.

TABLES

1. AREA AND POPULATION OF THE WORLD

SUMMARY

Length of earth's axis (miles)	7,900
Length of equator (miles)	24,900
Earth's Surface (sq. mi.)	**196,900,000**
Pacific Ocean (sq. mi.)	71,000,000
Atlantic Ocean (sq. mi.)	34,000,000
Indian Ocean (sq. mi.)	28,000,000
Arctic Ocean (sq. mi.)	4,000,000
Antarctic Ocean (sq. mi.)	2,700,000
The Sea (sq. mi.)	**139,700,000**

	Sq. Miles	Population
North America	9,392,000	146,126,000
South America	6,856,000	63,850,000
Europe	3,794,000	443,972,000
Asia	17,143,000	895,118,000
Africa	11,514,000	136,272,000
Australia, etc.	3,457,000	8,758,000
Antarctic Cont.	5,000,000	.....
The Land	**57,156,000**	**1,694,096,000**

NORTH AMERICA

	Sq. Miles	Population
United States (States in Table No. 6)	3,088,519	105,711,000
Alaska	590,884	55,000
Dom. of Canada	3,759,365	8,788,000
Nova Scotia	21,428	524,000
N. Brunswick	27,985	388,000
Prince Edw. I.	2,184	89,000
Quebec	706,834	2,361,000
Ontario	376,722	2,934,000
Manitoba	251,832	610,000
Saskatchewan	251,700	757,000
Alberta	255,285	588,000
Brit. Columbia	355,855	525,000
Territories	1,479,000	12,000
Part Gt. Lakes	30,540	.....
Newf'dland, etc.	49,680	268,000
Newfoundland	42,730	264,000
Labrador	6,950	4,000
St. Pierre, etc.	93	5,000
Greenland	838,000	14,000
Mexico	767,300	15,503,000
Central America	206,753	5,813,000
Guatemala	43,640	2,100,000
Brit. Honduras	8,600	45,000
Honduras	44,276	637,000
Salvador	8,170	1,501,000
Nicaragua	49,550	638,000
Costa Rica	18,690	468,000
Panama	33,300	401,000
Canal Zone	527	23,000
West Indies	91,400	9,947,000
Cuba	44,000	2,889,000
Haiti, Rep. of	11,070	2,500,000
Dominican Rep.	18,750	897,000
Jamaica	4,840	858,000
Porto Rico	3,435	1,300,000
Bahama Is.	4,400	53,000
Lesser Antilles	4,905	1,450,000
Bermuda Is.	19	22,000

SOUTH AMERICA

	Sq. Miles	Population
Brazil	3,300,000	30,645,000
Argentina	1,084,000	8,699,000
Paraguay	100,000	1,050,000
Uruguay	69,000	1,495,000
Chile	293,000	3,755,000
Bolivia	440,000	2,890,000
Peru	440,000	4,586,000
Ecuador	118,000	2,000,000
Colombia	466,000	5,855,000
Venezuela	364,000	2,412,000
Guiana, British	95,000	298,000
Guiana, Dutch	50,000	113,000
Guiana, French	30,500	49,000
Falkland Is., etc.	6,570	3,000

EUROPE

	Sq. Miles	Population
United Kingdom	94,350	44,168,000
England	50,850	35,679,000
Wales	7,473	2,207,000
Scotland	30,405	4,882,000
N. Ireland	5,320	1,250,000
Small islands	302	150,000
Irish Free St.	27,040	3,140,000
Germany	179,500	59,857,000
Prussia	109,600	37,075,000
Bavaria	29,180	7,140,000
Saxony	5,789	4,670,000
Other states	34,931	10,972,000
Belgium	11,760	7,684,000
Netherlands	12,772	6,841,000
Denmark	16,585	3,289,000
Iceland	39,770	95,000
Faroe Islands	540	21,000
Norway	124,710	2,646,000
Sweden	172,928	5,904,000
Poland	149,000	27,442,000
Danzig	600	365,000
Lithuania	25,000	2,300,000
Latvia	24,000	1,503,000
Esthonia	18,500	1,110,000
Monaco	8	23,000
Luxemburg	999	264,000
Sarre Basin	750	658,000
Andorra	175	5,000
France	212,822	39,210,000
Spain	192,000	20,784,000
Gibraltar	2	25,000
Portugal	34,264	5,546,000
Azores	922	243,000
Switzerland	15,956	3,880,000
Italy	123,000	40,120,000
San Marino	24	12,000
Malta	124	225,000
Liechtenstein	61	11,000
Austria	30,700	6,131,000
Hungary	36,000	7,841,000
Czechoslovakia	54,700	13,596,000
Yugoslavia	95,000	12,017,000
Rumania	116,000	17,393,000
Bulgaria	40,000	4,910,000
Albania	11,000	832,000
Greece	42,000	4,932,000
Turkey in Eur.	10,000	1,800,000
Russia in Eur.	1,716,500	93,782,000
Russia proper	1,125,000	58,924,000
Ukraine	173,000	25,605,000
Other areas	418,500	9,253,000
Finland	130,000	3,367,000
Arctic islands	33,500	.....

ASIA

	Sq. Miles	Population
Turkey in Asia	295,000	10,000,000
Syria	80,000	3,000,000
Iraq	140,000	2,850,000
Palestine	9,000	757,000
Cyprus	3,580	311,000
Sinai (Egypt)	22,800	26,000
Hedjaz	140,000	600,000
Aden, etc.	15,870	177,000
Oman	75,000	500,000
Other Arabia	906,500	2,000,000
Persia	635,000	9,500,000
Afghanistan	240,900	6,380,000
Portug. India	1,400	548,000
Indian Empire	1,856,500	319,075,000
India proper	1,446,200	305,069,000
Burma	268,700	13,206,000
Baluchistan	141,600	800,000
Nepal	54,000	5,600,000
Bhutan	18,600	250,000
Ceylon, etc.	25,500	4,568,000
Straits Sttl's, etc.	35,600	2,377,000
Siam	245,000	8,266,000
French Indo-China, etc.	256,500	17,269,000
East Indies	788,000	60,694,000
Philippine Is.	115,000	10,351,000
Java	51,000	35,017,000
Sumatra, etc.	185,000	6,295,000
Borneo	290,000	2,459,000
Other islands	147,000	6,572,000
China, etc.	4,300,000	320,880,000
China proper	1,497,000	302,340,000
Tibet	814,000	2,000,000
Sinkiang	550,000	2,000,000
Mongolia	1,076,000	1,800,000
Manchuria	363,000	12,740,000
Hongkong	400	625,000
Weihaiwei	280	147,000
Macao	4	75,000
Japanese Empire	261,300	77,606,000
Japan	147,750	55,961,000
S. Sakhalin	14,700	106,000
Taiwan, etc.	13,400	3,654,000
Chosen	84,250	17,284,000
Dairen, etc.	1,200	601,000
Russia in Asia	6,721,500	41,037,000
Siberia	4,807,000	11,161,000
Kirghiz in Asia	780,000	4,546,000
Turkestan	570,000	7,202,000
Khiva	23,200	519,000
Bokhara	79,200	3,000,000
Azerbaijan	34,000	2,097,000
Georgia	26,000	2,372,000
Armenia	15,000	1,214,000
Russia proper, etc.	191,500	8,926,000
Lake Aral and Caspian Sea	195,600	.....
Arctic islands	14,900	.....

AFRICA

	Sq. Miles	Population
Egypt (Including parts of the Sahara)	400,000	13,387,000
Libia (Including parts of the Sahara)	542,000	525,000
Tunis (Including parts of the Sahara)	64,600	2,094,000
Algeria (Including parts of the Sahara)	343,600	5,801,000
Morocco (Including parts of the Sahara)	176,000	5,000,000
Fr. Morocco	154,570	4,340,000
Sp. Morocco	21,200	600,000
Tangier (Int.)	230	60,000
Sahara, remaining part	1,944,000	695,000
Rio de Oro, etc.	82,100	224,000
Fr. West Africa	704,000	12,284,000
Gambia	3,700	248,000
Port. Guinea	13,100	289,000
Sierra Leone	26,900	1,403,000
Liberia	36,800	1,500,000

AFRICA (*continued*)

	Sq. Miles	Population
Gold Coast, etc..	88,800	2,430,000
Nigeria, etc.....	394,000	17,300,000
Anglo-Eg. Sudan	1,014,400	3,400,000
Abyssinia.....	312,000	8,000,000
Eritrea.....	42,500	450,000
French Somali..	6,000	208,000
British Somali..	59,800	300,000
Italian Somali...	190,000	700,000
Uganda.....	111,000	3,072,000
Kenya.....	247,000	2,630,000
Zanzibar.....	1,000	197,000
Tanganyika Ter.	384,200	4,000,000
Belgian Congo, etc.	947,200	15,400,000
Fr. Equatorial Af.	680,600	10,000,000
Fr. Cameroon...	160,000	1,500,000
Angola, etc.....	490,800	4,120,000
Mozambique....	295,800	3,120,000
Union of S. Af...	792,340	6,926,000
C. of Gd. Hope.	277,000	2,781,000
Natal.....	34,710	1,194,000
Or. Free State..	48,340	628,000
Transvaal.....	114,290	2,086,000
S. W. Africa...	318,000	237,000
Rhodesia.....	408,500	1,735,000
Other Brit. S. Af.	313,900	1,989,000
Madagascar.....	228,600	3,545,000
Other islands....	8,730	1,800,000

AUSTRALIA, ETC.

Com. of Australia	2,972,866	5,437,000
Victoria.....	87,884	1,532,000
New S. Wales..	310,660	2,100,000
Queensland....	668,497	758,000
South Australia	380,070	495,000
Western Austr..	975,920	332,000
Tasmania.....	26,215	214,000
Northern Ter...	523,620	4,000
New Zealand....	104,663	1,221,000
New Guinea Gr.	311,000	1,000,000
Bismarck Arch...	18,190	188,000
Solomon Islands	16,950	200,000
New Caledonia..	7,650	51,000
New Hebrides...	5,100	60,000
Fiji Islands.....	8,050	140,000
Samoa Islands..	1,076	45,000
Hawaiian Is.....	6,449	256,000
Other Pacific Is..	5,385	160,000

2. LAKES

	Area, Sq. Miles	Altitude, Feet	Depth, Feet
Caspian.....	169,400±	−85±	3,600±
Superior....	31,200	603	1,008
Victoria.....	27,000±	3,720	270
Aral.....	26,200±	155±	220±
Huron.....	23,200	580	800
Michigan....	22,400	581	870
Baikal.....	13,200	1,680	4,900
Tanganyika.	12,700	2,600	2,000
Great Bear L.	11,200	200	270
Nyasa.....	11,000	1,650	2,316
Chad.....	10,000+	850±	24±
Erie.....	10,000	573	200
Winnipeg...	8,550	710	70
Balkash.....	8,400	780±	135±
Ontario.....	7,260	247	738
Ladoga.....	7,000	55	730
Titicaca.....	4,000	13,860	984
Nicaragua...	2,970	135	260
Great Salt L.	1,750±	4,218±	40±
Dead Sea...	350±	−1,292±	1,280±

3. RACES OF MANKIND

Caucasian, or white.....	860,000,000
Mongolian, or yellow.....	650,000,000
Negro, or black.....	155,000,000
Indian, or red.....	30,000,000

4. RIVERS AND RIVER BASINS

River	Area of Basin, Sq. Miles	Longest Stream, Miles	Navigable, Miles
Amazon.....	2,320,000	3,500	2,686
Amur.....	780,000	2,700	2,400
Colorado.....	230,000	1,000	500
Columbia.....	290,000	1,400	200
Congo.....	1,500,000	2,800	1,100
Danube.....	320,000	1,800	1,700
Dnieper.....	197,000	1,300	1,200
Elbe.....	55,340	612	525
Euphrates.....	490,000	2,000	550
Ganges-Brahmaputra	600,000	1,800	1,300 800
Hwang.....	390,000	2,800	Little
Indus.....	360,000	1,900	400
Irrawaddy.....	180,000	1,200	900
Lena.....	900,000	2,800	2,500
Loire.....	46,755	543	Little
Mackenzie.....	680,000	2,100	1,800
Magdalena.....	90,000	1,100	600
Mekong.....	280,000	2,600	1,200
Mississippi-Missouri.....	1,250,000	4,200	2,000 2,400
Murray.....	350,000	1,100	550
Nelson-Saskatchewan...	470,000	1,900	230 600
Niger.....	1,000,000	2,600	2,250
Nile.....	1,300,000	3,700	2,900
Ob.....	1,100,000	3,000	2,000
Orange.....	270,000	1,200	40
Orinoco.....	425,000	1,500	870
Plata.....	1,150,000	2,500	1,600
Po.....	27,000	460	337
Rhine.....	63,265	709	550
Rhone.....	38,180	447	200
Rio Grande....	230,000	1,800	460
St. Lawrence...	565,000	2,100	2,000
São Francisco..	210,000	1,800	1,100
Volga.....	590,000	2,300	2,100
Yangtze.....	690,000	3,100	1,050
Yenisei.....	1,500,000	3,000	1,840
Yukon.....	380,000	1,865	1,600
Zambezi.....	580,000	2,200	1,620

5. GREAT SHIP CANALS

Canal, and Year when Opened	Connections	Length, Miles	Depth, Feet
Welland, 1833	Lake Erie Lake Ontario	26¾	14
Soo (U. S.), 1855	Lake Superior Lake Huron	1⅓	25
Suez, 1869	Mediterranean Sea, Red Sea	103	35
Corinth, 1893	G. of Corinth Aegean Sea	4	26
Manchester, 1894	Liverpool Manchester	35½	28
Kiel, 1895	North Sea Baltic Sea	61	36
Soo (Canadian), 1895	Lake Superior Lake Huron	1⅓	22
Cape Cod, 1914	Cape Cod Bay Buzzards Bay	8	25
Panama, 1915	Caribbean Sea Pacific Ocean	50	41

6. THE UNITED STATES

	Sq. Miles	Population, 1920
Alabama.....	51,998	2,348,174
Arizona.....	113,956	334,162
Arkansas.....	53,335	1,752,204
California.....	158,297	3,426,861
Colorado.....	103,948	939,629
Connecticut.....	4,965	1,380,631
Delaware.....	2,370	223,003
Dist. of Columbia	70	437,571
Florida.....	58,666	968,470
Georgia.....	59,265	2,895,832
Idaho.....	83,888	431,866
Illinois.....	56,665	6,485,280
Indiana.....	36,354	2,930,390
Iowa.....	56,147	2,404,021
Kansas.....	82,158	1,769,257
Kentucky.....	40,598	2,416,630
Louisiana.....	48,506	1,798,509
Maine.....	33,040	768,014
Maryland.....	12,327	1,449,661
Massachusetts.....	8,266	3,852,356
Michigan.....	57,980	3,668,412
Minnesota.....	84,682	2,387,125
Mississippi.....	46,865	1,790,618
Missouri.....	69,420	3,404,055
Montana.....	146,997	548,889
Nebraska.....	77,520	1,296,372
Nevada.....	110,690	77,407
New Hampshire...	9,341	443,083
New Jersey.....	8,224	3,155,900
New Mexico.....	122,634	360,350
New York.....	49,204	10,385,227
North Carolina....	54,426	2,559,123
North Dakota.....	70,837	646,872
Ohio.....	41,040	5,759,394
Oklahoma.....	70,057	2,028,283
Oregon.....	96,699	783,389
Pennsylvania.....	45,126	8,720,017
Rhode Island.....	1,248	604,397
South Carolina.....	30,989	1,683,724
South Dakota.....	77,615	636,547
Tennessee.....	42,022	2,337,885
Texas.....	265,896	4,663,228
Utah.....	84,990	449,396
Vermont.....	9,564	352,428
Virginia.....	42,627	2,309,187
Washington.....	69,127	1,356,621
West Virginia.....	24,170	1,463,701
Wisconsin.....	56,066	2,632,067
Wyoming.....	97,914	194,402
Part of the Great Lakes.....	61,730	
Main Body.....	**3,088,519**	**105,710,620**

Outlying Territory, etc.

Alaska Territory..	590,884	55,036
Hawaii Territory..	6,449	255,912
Porto Rico.....	3,435	1,299,809
Virgin Islands of the United States ('17).....	132	26,051
Philippine Is. ('18)	115,026	10,350,640
Tutuila, etc.....	77	8,056
Guam.....	210	13,275
Panama Canal Zone.....	527	22,858
Soldiers and sailors stationed abroad		117,238
Total Outlying....	**716,740**	**12,148,875**
Grand Total.....	**3,805,259**	**117,859,495**

7. COMMERCIAL STATISTICS OF THE

Countries	Chief Products	Chief Exports	Total Value of Exports
Alaska			$55,087,000
Algeria	Wine, cereals, animals, fruits, tobacco, cork	Wines, wheat, sheep, tobacco, cigarettes	111,747,000
Argentina	Wheat, corn, livestock, wine, flax	Wheat, corn, meat, flaxseed	553,087,000
Australia	Wool, cereals, animal products, minerals	Wool, wheat, meat, hides, skins, butter	489,138,000
Austria	Cereals, potatoes, timber, minerals	Chemicals, ores, furniture, timber, fruits	208,790,000
Belgium	Manufactures wool, cotton, iron, steel	Coal, wool and cotton yarn, textiles, iron	462,220,000
Bolivia	Silver, tin, copper, rubber, cacao, coffee	Silver, tin, rubber [and steel goods	24,587,000
Brazil	Coffee, sugar, cotton, rubber, cacao, cattle	Coffee, sugar, cotton, leather, cacao	301,972,000
Bulgaria	Cereals, fruits, wine, tobacco	Cereals, tobacco, hides, attar of roses	29,801,000
Canada	Agricultural prod'ts, textiles, wood, minerals	Wheat and flour, wood, pulp, paper	994,797,000
Ceylon	Rice, tea, coconuts, rubber	Rubber, tea, coconuts, oil, graphite	86,481,000
Chile	Nitrate, copper, silver, cereals, wines	Nitrates, copper, meat, iodine	110,157,000
China	Cereals, vegetables, silk, cotton, coal, iron,	Silk, beans, bean cake oils, cotton	536,815,000
Colombia	Coffee, bananas, minerals, cattle [textiles	Coffee, platinum, bananas, hides	63,512,000
Costa Rica	Coffee, bananas, gold, silver	Coffee, bananas, cacao, gold, silver	14,224,000
Cuba	Sugar, tobacco, fruits [iron	Sugar, tobacco	325,478,000
Czechoslovakia	Sugar beets, potatoes, cereals, timber, coal,	Textiles, glass, coal, timber, sugar, iron	369,925,000
Denmark	Dairy products, cereals, potatoes, fish	Dairy products, animals, metal goods,	246,329,000
Dominican Rep.	Sugar, cacao, tobacco, coffee	Sugar, cacao, coffee, tobacco [textiles	15,231,000
Dutch E. Indies	Sugar, rubber, cinchona, tea, tobacco, tin	Sugar, coffee, tea, cinchona, rubber, tin	437,408,000
Ecuador	Cacao, coffee, ivory, nuts, rubber	Cacao, ivory, nuts, Panama hats, coffee	12,807,000
Esthonia	Cereals, potatoes, flax, timber, animals	Flax, timber, cellulose, meat	16,556,000
Egypt	Cotton, cereals, vegetables, sugar	Cotton, textiles, cereals	273,961,000
Finland	Timber, cereals, animals	Timber, pulp and paper, meats	117,648,000
France	Cereals, textiles, wine, iron, coal, potash	Textiles, clothing, chemicals, automobiles, wine	1,850,571,000
Germany	Cereals, potatoes, sug. beets, coal, iron, text'l's	Textiles, metal work, chemicals, coal	1,448,054,000
Great Britain	Textiles, coal, iron and steel goods	Textiles, coal, iron and steel	3,510,394,000
Greece	Currants, wine, cereals, tobacco, olives, nuts	Currants, olives, tobacco	82,154,000
Guatemala	Coffee, sugar, bananas, animals, dye woods	Coffee, bananas, sugar, timber, hides	14,726,000
Haiti	Coffee, cotton, cacao, sugar, logwood	Coffee, cotton, cacao	14,591,000
Hawaii	Sugar, pineapples, coffee, honey, hides	Sugar, fruits, coffee, rice	102,667,000
Honduras	Bananas, coconuts, coffee, rubber, tobacco	Bananas, coconuts	10,016,000
Hungary	Cereals, animals, wood, coal, grapes, sug. beets	Flour, animal products	100,627,000
India	Rice, tea, wheat, cotton, jute, cattle	Tea, jute, oil seeds, cotton, rice, gums	1,018,786,000
Irish Free State	Vegetables, animals, flax, hay, fish	Animals, meats, dairy products	*
Italy	Cereals, fruits, wine, raw silk	Raw silk, textiles, wines, fruits	508,913,000
Japan	Rice, raw silk, tea, coffee, coal	Silk, cotton and silk goods, tea, matches	884,162,000
Latvia	Cereals, flax, timber, potatoes	Flax, timber	31,252,000
Lithuania	Cereals, potatoes, flax seed, timber	Animal prod'ts, timber, flax, hides, wool	14,680,000
Mexico	Silver, gold, copper, lead, petroleum, sugar,	Metals, petroleum, henequen	202,664,000
Morocco	Cereals, animals, fruits, nuts [henequen	Cereals, eggs, almonds, flaxseed, beans	23,542,000
Netherlands	Cereals, potatoes, sugar beets, animals	Dairy products, textiles, sugar, bulbs	509,566,000
Newfoundland	Fish, iron, and copper, wood pulp, paper	Codfish, pulp and paper, iron ore, etc.	20,937,000
New Zealand	Wool, meat, dairy products, metals	Wool, meat, dairy products, hides, skins	210,292,000
Nicaragua	Coffee, sugar, fruit, timber	Coffee, sugar, timber, bananas	7,903,000
Norway	Fish, timber, wood pulp, animal products	Animal products, fish, timber, paper	133,969,000
Panama	Fruits, cacao, coffee, rubber, wood, coconuts	Bananas, cacao, coconuts, gum	2,394,000
Paraguay	Cattle, maté, quebracho, tobacco, sugar	Hides, oranges, tobacco, timber, meat,	5,752,000
Persia	Cereals, fruits, gums, wool, cotton, petroleum	Petroleum, rugs, fruits, opium [quebracho	66,627,000
Peru	Sugar, cotton, coffee, cacao, copper, petrol'm	Sugar, cotton, copper, petroleum	99,673,000
Philippines	Rice, hemp, coconuts, sugar, tobacco, fruit	Hemp, sugar, copra, cigars	120,753,000
Poland	Cereals, sug. beets, potatoes, coal, salt, petr'l'm	Cereals, sugar, textiles, salt	230,748,000
Porto Rico	Sugar, tobacco, coffee, fruit, cotton	Sugar, tobacco, cigars, coffee, fruits	86,072,000
Portugal	Cereals, fruits, animals, wine, cork, fish	Cork, wool, sardines, hides, olive oil	42,728,000
Rumania	Cereals, livestock, salt, petroleum, timber	Cereals, livestock, timber, seeds	84,763,000
Russia, etc.	Cereals, flax, potatoes, timber, minerals	Timber, flax, wheat, metals	105,914,000
Salvador	Coffee, cacao, rubber, wood, sugar, henequen	Coffee, henequen, sugar, rubber	16,214,000
Siam	Rice, timber, tin	Rice, tin, teakwood	68,354,000
Spain	Cereals, beans, fruits, metals, coal	Wine, fruit, olive oil, iron ore	230,050,000
Sweden	Roots, hay, timber, iron	Timber, wood work, pulp, paper, iron	301,881,000
Switzerland	Textiles, dairy products, watches, clocks	Dairy products, textiles, time pieces	309,929,000
Turkey	Tobacco, cereals, fruits, wool, mohair, nuts	Carpets, wool, mohair, nuts	14,866,000
Un. of So. Afr.	Cereals, livestock, gold, diamonds	Gold, diamonds, wool	122,726,000
United States	Cereals, cotton, minerals, animals, food products, iron and steel goods	Cotton, iron and steel goods, breadstuffs, meat, dairy products	4,167,493,000
Uruguay	Livestock, cereals	Meat, wool, hides	61,500,000
Venezuela	Coffee, cacao, sugar, rubber, minerals	Coffee, cacao, rubber, hides, cattle	26,162,000
Yugoslavia	Fruits, wood, tobacco, silk, cereals, animals	Maize, animals, prunes, timber	49,919,000

PRINCIPAL COUNTRIES OF THE WORLD

Countries	Chief Imports	Total Value of Imports	Railroad Mileage	Chief Seaports
Alaska		$31,146,000	818	
Algeria	Automobiles, paper, clothing, sugar, petroleum	155,644,000	2,722	Algiers
Argentina	Textiles, iron and steel, foodstuffs, oils, glassware	564,244,000	21,935	Buenos Aires
Australia	Textiles, machinery, metal manufactures, clothing	422,803,000	26,202	Sydney, Melbourne
Austria	Foodstuffs, textiles, building materials, fuel	374,615,000	4,125	
Belgium	Wheat and flour, wool, machinery	655,005,000	5,686	Antwerp
Bolivia	Foodstuffs, textiles, clothing, hardware	13,774,000	1,401	
Brazil	Wheat, iron and steel goods, coal, cotton goods	213,992,000	18,110	Santos, Rio de Janeiro
Bulgaria	Textiles, metals, machinery, skins, oils	27,791,000	1,829	Varna
Canada	Manufactures of iron and steel, textiles, coal, sugar	885,778,000	39,771	Montreal, Vancouver
Ceylon	Rice, cotton goods, coal, sugar	91,384,000	732	Colombo
Chile	Textiles, metal goods, machinery, chemicals, sugar	78,789,000	5,102	Valparaiso, Antofagasta
China	Cotton goods, rice, machinery, metals	799,236,000	6,818	Shanghai, Canton
Columbia	Cotton goods, metals, foodstuffs, drugs	85,040,000	926	Barranquilla
Costa Rico	Cotton goods, flour, iron and steel, cattle	8,345,000	410	Limon
Cuba	Foodstuffs, textiles, machinery, chemicals	180,303,000	3,020	Havana
Czechoslovakia	Cotton and woolen goods, cereals, fats and oils	299,478,000	8,718	
Denmark	Textiles, hardware, coal, cereals	325,292,000	3,092	Copenhagen
Dominican Rep.	Foodstuffs, cotton goods, iron and steel goods	14,317,000	408	Santo Domingo
Dutch E. Indies	Cotton goods, iron and steel goods	266,052,000	2,011	Batavia
Ecuador	Textiles, foodstuffs, machinery, clothing	9,284,000	413	Guayaquil
Esthonia	Coal, salt, sugar, fertilizers, sugar	27,050,000	769	Reval
Egypt	Cereals, wood, coal, animal products, textiles	212,445,000	3,065	Alexandria
Finland	Cereals, coffee, tea, sugar, metals, machinery	123,616,000	2,660	Helsingfors
France	Coal, coke, cereals, cotton, wool, oil seeds, machinery, petroleum	1,982,926,000	33,568	Marseille, Havre
Germany	Cotton, wool, copper, iron ore, skins, hides	1,448,587,000	35,209	Hamburg, Bremen
Great Britain	Cotton, wool, cereals, meats, iron ore, petroleum,	5,023,229,000	23,734	Liverpool, London
Greece	Foodstuffs, textiles, metals, chemicals [timber	102,003,000	1,983	Piræus, Salonica
Guatemala	Cotton, iron and steel, machinery	13,763,000	478	Puerto Barrios
Haiti	Cotton goods, sacks, machinery	14,158,000	112	Port au Prince
Hawaii	Foodstuffs, clothing, machinery	75,106,000	969	Honolulu
Honduras	Cotton goods, foodstuffs, machinery	14,342,000	556	Puerto Cortes
Hungary	Cotton goods, wood work, woolens, coal, paper	117,287,000	4,493	
India	Cotton goods, metals, ores, machinery, sugar	706,132,000	37,265	Calcutta, Bombay
Irish Free State	Textiles, machinery, foodstuffs	*	2,700	Dublin
Italy	Wheat, coal, cotton, wool, fish, iron and steel	791,404,000	12,885	Genoa, Naples, Trieste
Japan	Cotton, iron, machinery, foodstuffs, oil cake	1,132,110,000	8,081	Yokohama, Kobe
Latvia	Textiles, foodstuffs, coal, machinery	40,891,000	1,825	Riga
Lithuania	Textiles, food products, agricultural machinery	15,663,000	1,550	Memel
Mexico	Textiles, machinery, hardware	178,239,000	16,442	Vera Cruz, Tampico
Morocco	Sugar, cotton goods, machinery	80,992,000	840	Tangier
Netherlands	Textiles, cereals, flour, iron and steel, coal, wood	785,617,000	2,380	Rotterdam, Amsterdam
Newfoundland	Textiles, flour, coal, hardware, machinery	19,123,000	952	St. Johns
New Zealand	Textiles, metal manuf'r's, clothing, oils, sugar, drugs	198,943,000	3,156	Auckland, Wellington
Nicaragua	Cotton goods, flour, chemicals, iron and steel	5,124,000	169	Corinto
Norway	Breadstuffs, textiles, minerals, vehicles	229,959,000	2,141	Oslo, Bergen
Panama	Cottons, iron and steel, flour, mineral oils	10,397,000	301	Colon
Paraguay	Textiles, foodstuffs, hardware	4,562,000	308	
Persia	Sugar, cotton goods, tea	56,208,000	350	Bushire
Peru	Foodstuffs, hardware, textiles, jute	58,812,000	1,997	Callao
Philippines	Cottons, iron and steel goods	87,500,000	803	Manila
Poland	Textiles, foodstuffs, machinery	215,479,000	9,541	Danzig (free city)
Porto Rico	Cotton goods, machinery	84,467,000	339	San Juan
Portugal	Coal, cotton goods, fish, rice, fertilizers	132,907,000	2,128	Lisbon, Oporto
Rumania	Textiles, machinery, leather, sugar, rubber, chem-	82,229,000	7,325	Galatz
Russia, etc.	Foodstuffs, machinery, textiles, drugs [icals	92,187,000	42,504	Leningrad, Vladivostock
Salvador	Cottons, hardware, flour, drugs, chemicals	8,842,000	260	Acajutla
Siam	Cotton goods, foodstuffs, metal goods, tobacco	60,909,000	1,376	Bangkok
Spain	Foodstuffs, machinery, cottons, hardware	442,192,000	9,842	Barcelona, Valencia
Sweden	Coal, metal goods, textiles, hides	291,533,000	9,439	Göteborg, Stockholm
Switzerland	Foodstuffs, textiles, metals, timber	401,980,000	3,586	
Turkey	Cottons, cereals, woolen goods, oils [ment	43,116,000	3,340	Constantinople
Un. of So. Afr.	Textiles, clothing, machinery, oils, electrical equip-	209,180,000	10,890	Cape Town
United States	Silk, sugar, wool, coffee, hides and skins, rubber, fibers, oils	3,792,066,000	262,544	New York, New Orleans Philadelphia
Uruguay	Textiles, machinery, foodstuffs	64,929,000	1,660	Montevideo
Venezuela	Textiles, machinery, foodstuffs	15,772,000	646	La Guaira
Yugoslavia	Foodstuffs, chemicals, machinery, metals	87,120,000	5,696	Fiume (in Italy)

8. POPULATION OF CITIES IN THE UNITED STATES AND ITS DEPENDENCIES

Cities having more than 25,000 People, together with Others Mentioned in the Text.

	Pop. 1920	Pop. 1910
Akron, Ohio	208,435	69,067
Alameda, Calif	28,806	23,383
Albany, N.Y.	113,344	100,253
Albuquerque, N.Mex.	15,157	11,020
Allentown, Pa.	73,502	51,913
Altoona, Pa.	60,331	52,127
Amsterdam, N.Y.	33,524	31,267
Anaconda, Mont.	11,668	10,134
Anderson, Ind.	29,767	22,476
Annapolis, Md.	11,214	8,609
Ann Arbor, Mich.	19,516	14,817
Asheville, N.C.	28,504	18,762
Astoria, Oregon	14,027	9,599
Atlanta, Ga.	200,616	154,839
Atlantic City, N.J.	50,707	46,150
Attleboro, Mass.	19,731	16,215
Auburn, N.Y.	36,192	34,668
Augusta, Ga.	52,548	41,040
Augusta, Maine	14,114	13,211
Aurora, Ill.	36,397	29,807
Austin, Tex.	34,876	29,860
Baltimore, Md.	733,826	558,485
Bangor, Maine	25,978	24,803
Baton Rouge, La.	21,782	14,897
Battle Creek, Mich.	36,164	25,267
Bay City, Mich.	47,554	45,166
Bayonne, N.J.	76,754	55,545
Beaumont, Tex.	40,422	20,640
Bellingham, Wash.	25,585	24,298
Berkeley, Calif.	56,036	40,434
Bethlehem, Pa.	50,358	12,837
Billings, Mont.	15,100	10,031
Binghamton, N.Y.	66,800	48,443
Birmingham, Ala.	178,806	132,685
Bisbee, Ariz.	9,205	9,019
Bismarck, N. Dak.	7,122	5,443
Bloomington, Ill.	28,725	25,768
Boise, Idaho	21,393	17,358
Boston, Mass.	748,060	670,585
Braddock, Pa.	20,879	19,357
Bridgeport, Conn.	143,555	102,054
Brockton, Mass.	66,254	56,878
Brookline, Mass.	37,748	27,792
Buffalo, N.Y	506,775	423,715
Burlington, Iowa	24,057	24,324
Burlington, Vt.	22,779	20,468
Butte, Mont.	41,611	39,165
Cambridge, Mass.	109,694	104,839
Camden, N.J.	116,309	94,538
Canton, Ohio	87,091	50,217
Carson City, Nev	1,685	2,466
Casper, Wyo	11,447	2,639
Cedar Rapids, Iowa	45,566	32,811
Charleston, S.C.	67,957	58,833
Charleston, W. Va.	39,608	22,996
Charlotte, N.C.	46,338	34,014
Chattanooga, Tenn.	57,895	44,604
Chelsea, Mass.	43,184	32,452
Chester, Pa.	58,030	38,537
Cheyenne, Wyo.	13,829	11,320
Chicago, Ill.	2,701,705	2,185,283
Chicopee, Mass.	36,214	25,401
Cicero, Ill.	44,995	14,557
Cincinnati, Ohio	401,247	363,591
Clarksburg, W. Va.	27,869	9,201
Cleveland, Ohio	796,841	560,663
Clifton, N. J.	26,470	11,869
Clinton, Iowa	24,151	25,577
Cohoes, N.Y.	22,987	24,709
Colorado Spr's, Colo.	30,105	29,078
Columbia, S.C.	37,524	26,319
Columbus, Ga.	31,125	20,554
Columbus, Ohio.	237,031	181,511
Concord, N.H.	22,167	21,497
Council Bluffs, Iowa	36,162	29,292
Covington, Ky.	57,121	53,270
Cranston, R.I.	29,407	21,107
Cumberland, Md.	29,837	21,839
Dallas, Tex.	158,976	92,104
Danville, Ill.	33,776	27,871
Danville, Va.	21,539	19,020
Davenport, Iowa	56,727	43,028
Dayton, Ohio.	152,559	116,577
Decatur, Ill.	43,818	31,140
Denver, Colo.	256,491	213,381
Des Moines, Iowa	126,468	86,368
Detroit, Mich.	993,678	465,766
Dover, Del.	4,042	3,720
Dubuque, Iowa	39,141	38,494
Duluth, Minn.	98,917	78,466
Durham, N.C.	21,719	18,241
East Chicago, Ind.	35,967	19,098
East Cleveland, Ohio	27,292	9,179
East Liverpool, Ohio	21,411	20,387
Easton, Pa.	33,813	28,523
East Orange, N.J.	50,710	34,371
East St. Louis, Ill.	66,767	58,547
Elgin, Ill.	27,454	25,976
Elizabeth, N.J.	95,783	73,409
Elmira, N.Y.	45,393	37,176
El Paso, Tex.	77,560	39,279
Erie, Pa.	93,372	66,525
Evanston, Ill.	37,234	24,978
Evansville, Ind.	85,264	69,647
Everett, Mass.	40,120	33,484
Everett, Wash.	27,644	24,814
Fall River, Mass.	120,485	119,295
Fargo, N. Dak.	21,961	14,331
Fitchburg, Mass.	41,029	37,826
Flint, Mich.	91,599	38,550
Fort Smith, Ark.	28,870	23,975
Fort Wayne, Ind.	86,549	63,933
Fort Worth, Tex.	106,482	73,312
Frankfort, Ky.	9,805	10,465
Fresno, Calif.	45,086	24,892
Galveston, Tex.	44,255	36,981
Gary, Ind.	55,378	16,802
Glens Falls, N.Y.	16,638	15,243
Gloucester, Mass.	22,947	24,398
Gloversville, N.Y.	22,075	20,642
Grand Rapids, Mich.	137,634	112,571
Great Falls, Mont.	24,121	13,948
Green Bay, Wis.	31,017	25,236
Hagerstown, Md.	28,064	16,507
Hamilton, Ohio	39,675	35,279
Hammond, Ind.	36,004	20,925
Hamtramck, Mich.	48,615	3,559
Harrisburg, Pa.	75,917	64,186
Hartford, Conn.	138,036	98,915
Haverhill, Mass.	53,884	44,115
Hazleton, Pa.	32,277	25,452
Helena, Mont.	12,037	12,515
Highland Park, Mich.	46,499	4,120
Hoboken, N.J.	68,166	70,324
Holyoke, Mass.	60,203	57,730
Homestead, Pa.	20,452	18,713
Honolulu, Hawaii	83,327	52,183
Houston, Tex.	138,276	78,800
Huntington, W. Va.	50,177	31,161
Indianapolis, Ind.	314,194	233,650
Irvington, N.J.	25,480	11,877
Ithaca, N.Y.	17,004	14,802
Jackson, Mich.	48,374	31,433
Jackson, Miss.	22,817	21,262
Jacksonville, Fla.	91,558	57,699
Jamestown, N.Y.	38,917	31,297
Jefferson City, Mo.	14,490	11,850
Jersey City, N.J.	298,103	267,779
Johnstown, N.Y.	10,908	10,447
Johnstown, Pa.	67,327	55,482
Joliet, Ill.	38,442	34,670
Joplin, Mo.	29,902	32,073
Kalamazoo, Mich.	48,487	39,437
Kansas City, Kans.	101,177	82,331
Kansas City, Mo.	324,410	248,381
Kearney, N. J.	26,724	18,659
Kenosha, Wis.	40,472	21,371
Key West, Fla.	18,749	19,945
Kingston, N.Y.	26,688	25,908
Knoxville, Tenn.	77,818	36,346
Kokomo, Ind.	30,067	17,010
Lackawanna, N.Y.	17,918	14,549
La Crosse, Wis.	30,421	30,417
Lakewood, Ohio	41,732	15,181
Lancaster, Pa.	53,150	47,227
Lansing, Mich.	57,327	31,229
Lawrence, Mass.	94,270	85,892
Lewiston, Maine	31,791	26,247
Lexington, Ky.	41,534	35,099
Lima, Ohio	41,326	30,508
Lincoln, Nebr.	54,948	43,973
Little Rock, Ark.	65,142	45,941
Long Beach, Calif.	55,593	17,809
Lorain, Ohio	37,295	28,883
Los Angeles, Calif.	576,673	319,198
Louisville, Ky.	234,891	223,928
Lowell, Mass.	112,759	106,294
Lynchburg, Va.	30,070	29,494
Lynn, Mass.	99,148	89,336
McKeesport, Pa.	46,781	42,694
Macon, Ga.	52,995	40,665
Madison, Wis.	38,378	25,531
Malden, Mass.	49,103	44,404
Manchester, N.H.	78,384	70,063
Manila, P. I. ('19, '03)	283,613	219,928
Mansfield, Ohio	27,824	20,768
Marion, Ohio	27,891	18,232
Medford, Mass.	39,038	23,150
Memphis, Tenn.	162,351	131,105
Meriden, Conn.	29,867	27,265
Meridian, Miss.	23,399	23,285
Miami, Fla.	29,571	5,471
Milwaukee, Wis.	457,147	373,857
Minneapolis, Minn.	380,582	301,408
Missoula, Mont.	12,668	12,869
Mobile, Ala	60,777	51,521
Moline, Ill.	30,734	24,199
Montclair, N.J.	28,810	21,550
Montgomery, Ala.	43,464	38,136
Montpelier, Vt.	7,125	7,856
Mount Vernon, N.Y.	42,726	30,919
Muncie, Ind.	36,524	24,005
Muskegon, Mich.	36,570	24,062
Muskogee, Okla.	30,277	25,278
Nashua, N.H.	28,379	26,005
Nashville, Tenn.	118,342	110,364
Natchez, Miss.	12,608	11,791
Newark, N.J.	414,524	347,469
Newark, Ohio	26,718	25,404
New Bedford, Mass.	121,217	96,652
New Britain, Conn.	59,316	43,916
New Brunswick, N.J.	32,779	23,388
Newburgh, N.Y.	30,366	27,805

	Pop. 1920	Pop. 1910
New Castle, Pa.	44,938	36,280
New Haven, Conn.	162,537	133,605
New London, Conn.	25,688	19,659
New Orleans, La.	387,219	339,075
Newport, Ky.	29,317	30,309
Newport, R. I.	30,255	27,149
Newport News, Va.	35,596	20,205
New Rochelle, N. Y.	36,213	28,867
Newton, Mass.	46,054	39,806
New York, N. Y.	5,620,048	4,766,883
Manhattan Boro.	2,284,103	2,331,542
Brooklyn "	2,018,356	1,634,351
Bronx "	732,016	430,980
Queens "	469,042	284,041
Richmond "	116,531	85,969
Niagara Falls, N. Y.	50,760	30,445
Norfolk, Va.	115,777	67,452
Norristown, Pa.	32,319	27,875
Norwalk, Conn.	27,743	24,211
Oakland, Calif.	216,261	150,174
Oak Park, Ill.	39,858	19,444
Ogden, Utah.	32,804	25,580
Ogdensburg, N. Y.	14,609	15,933
Oklahoma City, Okla.	91,295	64,205
Olympia, Wash.	7,795	6,996
Omaha, Nebr.	191,601	124,096
Orange, N. J.	33,268	29,630
Oshkosh, Wis.	33,162	33,062
Oswego, N. Y.	23,626	23,368
Paducah, Ky.	24,735	22,760
Pasadena, Calif.	45,354	30,291
Passaic, N. J.	63,841	54,773
Paterson, N. J.	135,875	125,600
Pawtucket, R. I.	64,248	51,622
Pensacola, Fla.	31,035	22,982
Peoria, Ill.	76,121	66,950
Perth Amboy, N. J.	41,707	32,121
Petersburg, Va.	31,012	24,127
Philadelphia, Pa.	1,823,779	1,549,008
Phoenix, Ariz.	29,053	11,134
Pierre, S. Dak.	3,209	3,656
Pittsburgh, Pa.	588,343	533,905
Pittsfield, Mass.	41,763	32,121
Plainfield, N. J.	27,700	20,550
Pocatello, Idaho.	15,001	9,110
Ponce, P. R.	41,561	35,027
Pontiac, Mich.	34,273	14,532
Port Huron, Mich.	25,944	18,863
Portland, Maine.	69,272	58,571
Portland, Oregon	258,288	207,214
Portsmouth, N. H.	13,569	11,269
Portsmouth, Ohio.	33,011	23,481
Portsmouth, Va.	54,387	33,190
Pottsville, Pa.	21,876	20,236
Poughkeepsie, N. Y.	35,000	27,936
Providence, R. I.	237,595	224,326
Pueblo, Colo.	43,050	41,747
Quincy, Ill.	35,978	36,587
Quincy, Mass.	47,876	32,642
Racine, Wis.	58,593	38,002
Raleigh, N. C.	24,418	19,218
Reading, Pa.	107,784	96,071
Reno, Nev.	12,016	10,867
Revere, Mass.	28,823	18,219
Richmond, Ind.	26,765	22,324
Richmond, Va.	171,667	127,628
Riverside, Calif.	19,341	15,212
Roanoke, Va.	50,842	34,874
Rochester, N. Y.	295,750	218,149
Rockford, Ill.	65,651	45,401
Rock Island, Ill.	35,177	24,335
Rome, N. Y.	26,341	20,497
Rutland, Vt.	14,954	13,546
Sacramento, Calif.	65,908	44,696
Saginaw, Mich.	61,903	50,510
St. Augustine, Fla.	6,192	5,494
St. Joseph, Mo.	77,939	77,403
St. Louis, Mo.	772,897	687,029
St. Paul, Minn.	234,698	214,744
Salem, Mass.	42,529	43,697
Salem, Oregon	17,679	14,094
Salt Lake City, Utah	118,110	92,777
San Antonio, Tex.	161,379	96,614
San Diego, Calif.	74,683	39,578
San Francisco, Calif.	506,676	416,912
San Jose, Calif.	39,642	28,946
San Juan, P. R.	70,707	49,000
Santa Barbara, Calif.	19,441	11,659
Santa Fe, N. Mex.	7,236	5,072
Savannah, Ga.	83,252	65,064
Schenectady, N. Y.	88,723	72,826
Scranton, Pa.	137,783	129,867
Seattle, Wash.	315,312	237,194
Sheboygan, Wis.	30,955	26,398
Sheridan, Wyo.	9,175	8,408
Shreveport, La.	43,874	28,015
Sioux City, Iowa	71,227	47,828
Sioux Falls, S. Dak.	25,202	14,094
Somerville, Mass.	93,091	77,236
South Bend, Ind.	70,983	53,684
Spartanburg, S. C.	22,638	17,517
Spokane, Wash.	104,437	104,402
Springfield, Ill.	59,183	51,678
Springfield, Mass.	129,614	88,926
Springfield, Mo.	39,631	35,201
Springfield, Ohio.	60,840	46,921
Stamford, Conn.	35,096	25,138
Steubenville, Ohio.	28,508	22,391
Stockton, Calif.	40,296	23,253
Superior, Wis.	39,671	40,384
Syracuse, N. Y.	171,717	137,249
Tacoma, Wash.	96,965	83,743
Tallahassee, Fla.	5,637	5,018
Tampa, Fla.	51,608	37,782
Taunton, Mass.	37,137	34,259
Terre Haute, Ind.	66,083	58,157
Toledo, Ohio	243,164	168,497
Topeka, Kans.	50,022	43,684
Trenton, N. J.	119,289	96,815
Trinidad, Colo.	10,906	10,204
Troy, N. Y.	72,013	76,813
Tucson, Ariz.	20,292	13,193
Tulsa, Okla.	72,075	18,182
Utica, N. Y.	94,156	74,419
Vicksburg, Miss.	18,072	20,814
Waco, Tex.	38,500	26,425
Walla Walla, Wash.	15,503	19,364
Waltham, Mass.	30,915	27,834
Warren, Ohio	27,050	11,081
Washington, D. C.	437,571	331,069
Waterbury, Conn.	91,715	73,141
Waterloo, Iowa.	36,230	26,693
Watertown, N. Y.	31,285	26,730
West Hoboken, N. J.	40,074	35,403
West New York, N. J.	29,926	13,560
Wheeling, W. Va.	56,208	41,641
Wichita, Kans.	72,217	52,450
Wichita Falls, Tex.	40,079	8,200
Wilkes-Barre, Pa.	73,833	67,105
Williamsport, Pa.	36,198	31,860
Wilmington, Del.	110,168	87,411
Wilmington, N. C.	33,372	25,748
Winston-Salem, N. C.	48,395	22,700
Woonsocket, R. I.	43,496	38,125
Worcester, Mass.	179,754	145,986
Yakima, Wash.	18,539	14,082
Yonkers, N. Y.	100,176	79,803
York, Pa.	47,512	44,750
Youngstown, Ohio.	132,358	79,066
Zanesville, Ohio.	29,569	28,026

9. POPULATION OF CITIES IN FOREIGN COUNTRIES

Cities having more than 250,000 People, together with Others Mentioned in the Text

Aberdeen, Scotland	159,000	('21)	Barcelona, Spain	710,000	('20)	Breslau, Germany	528,000	('19)
Adelaide, Australia	261,000	('21)	Barmen, Germany	156,000	('19)	Brest, France	74,000	('21)
Aleppo, Syria	140,000		Barranquilla, Colombia	65,000	('21)	Brisbane, Australia	210,000	('21)
Alexandria, Egypt	445,000	('17)	Basel, Switzerland	136,000	('20)	Bristol, England	377,000	('21)
Algiers, Algeria	207,000	('21)	Batavia, Java	139,000	('20)	Brussels, Belgium	775,000	('21)
Amiens, France	93,000	('21)	Beirut, Syria	80,000		Bucharest, Rumania	309,000	('17)
Amsterdam, Neth.	647,000	('20)	Belfast, Nor. Ireland	425,000	('22)	Budapest, Hungary	1,185,000	('21)
Antwerp, Belgium	304,000	('21)	Belgrade, Yugoslavia	120,000	('19)	Buenos Aires, Argent.	1,720,000	('22)
Archangel, Russia	45,000	('21)	Benares, India	198,000	('21)	Cairo, Egypt	791,000	('17)
Arequipa, Peru	35,000	('20)	Bergen, Norway	91,000	('20)	Calais, France	73,000	('21)
Astrakhan, Russia	123,000	('21)	Berlin, Germany	3,804,000	('19)	Calcutta, India	1,328,000	('21)
Asuncion, Paraguay	100,000	('20)	Bern, Switzerland	105,000	('20)	Calgary, Canada	63,000	('21)
Athens, Greece	293,000	('20)	Bilbao, Spain	113,000	('20)	Callao, Peru	53,000	('20)
Auckland, New Zealand	164,000	('22)	Birmingham, England	919,000	('21)	Canton, China	900,000	('21)
Augsburg, Germany	155,000	('19)	Bogota, Colombia	160,000	('21)	Cape Town, S. Africa	207,000	('21)
Bagdad, Iraq	250,000	('20)	Bombay, India	1,174,000	('21)	Caracas, Venezuela	92,000	('20)
Bahia, Brazil	283,000	('20)	Bordeaux, France	267,000	('21)	Cardiff, Wales	200,000	('21)
Baku, Azerbaijan, Rus.	263,000	('21)	Boulogne, France	55,000	('21)	Cartagena, Spain	97,000	('20)
Ballarat, Australia	39,000	('21)	Bradford, England	286,000	('21)	Catania, Italy	255,000	('21)
Bangkok, Siam	630,000	('20)	Bremen, Germany	270,000	('19)	Changsha, China	536,000	('21)

Chemnitz, Germany	304,000	('19)
Cherbourg, France	38,000	('21)
Chungking, China	497,000	('21)
Cologne, Germany	634,000	('19)
Colombo, Ceylon	244,000	('21)
Colon, Panama	31,000	('20)
Constantinople, Turk.	1,000,000	
Copenhagen, Denmark	561,000	('16)
Crefeld, Germany	124,000	('19)
Dairen, Manchuria	239,000	('20)
Damascus, Syria	170,000	
Danzig, Danzig	195,000	('23)
Delhi, India	304,000	('21)
Dortmund, Germany	295,000	('19)
Dresden, Germany	529,000	('19)
Dublin, Irish Free State	427,000	('22)
Durban, South Africa	146,000	('21)
Dusseldorf, Germany	407,000	('19)
Edinburgh, Scotland	420,000	('21)
Edmonton, Canada	59,000	('21)
Elberfeld, Germany	157,000	('19)
Essen, Germany	439,000	('19)
Fiume, Italy	50,000	('23)
Florence, Italy	254,000	('21)
Foochow, China	320,000	('21)
Frankfort on Main, Ger.	433,000	('19)
Freetown, Sierra Leone	44,000	('21)
Galatz, Rumania	74,000	('17)
Geneva, Switzerland	135,000	('20)
Genoa, Italy	301,000	('21)
Georgetown, Br. Guiana	55,000	('21)
Glasgow, Scotland	1,034,000	('21)
Göteborg, Sweden	227,000	('22)
Grimsby, England	82,000	('21)
Guadalajara, Mexico	119,000	('10)
Guatemala, Guatemala	91,000	('21)
Guayaquil, Ecuador	100,000	('19)
Hague, Netherlands	355,000	('19)
Halifax, Canada	58,000	('21)
Hamburg, Germany	986,000	('19)
Hamilton, Canada	114,000	('21)
Hangchow, China	892,000	('21)
Hankow, China	1,468,000	('20)
Hanoi, Fr. Indo-China	119,000	('21)
Hanover, Germany	393,000	('19)
Harbin, Manchuria	156,000	('21)
Havana, Cuba	364,000	('20)
Havre, France	163,000	('21)
Heidelberg, Germany	70,000	('19)
Helsingfors, Finland	198,000	('20)
Hobart, Tasmania	52,000	('21)
Hull, England	287,000	('21)
Hyderabad, India	404,000	('21)
Innsbruck, Austria	56,000	('20)
Iquique, Chile	37,000	('20)
Irkutsk, Siberia	104,000	('21)
Jerusalem, Palestine	63,000	('22)
Johannesburg, S. Af.	284,000	('21)
Kabul, Afghanistan	150,000	
Karachi, India	217,000	('21)
Kashgar, Sinkiang	60,000	
Kharkof, Russia	284,000	('21)
Khartum, Ang.-Eg. Sud.	31,000	
Kief, Russia	366,000	('21)
Kiel, Germany	205,000	('19)
Kimberley, S. Africa	39,000	('21)
Kingston, Jamaica	63,000	('21)
Kobe, Japan	609,000	('20)
Königsberg, Germany	261,000	('19)
Kovno, Lithuania	90,000	('14)
Krakow, Poland	181,000	('21)
Kyoto, Japan	591,000	('20)
La Paz, Bolivia	107,000	('18)
La Plata, Argentina	90,000	('14)
Lassa, Tibet	20,000	
Leeds, England	458,000	('21)
Leghorn, Italy	115,000	('21)
Leicester, England	234,000	('21)
Leipzig, Germany	604,000	('19)
Lemberg, Poland	219,000	('21)
Leningrad, Russia	1,067,000	('23)
Liege, Belgium	165,000	('21)
Lille, France	201,000	('21)
Lima, Peru	176,000	('20)
Limoges, France	90,000	('21)
Lisbon, Portugal	490,000	('20)
Liverpool, England	803,000	('21)
Lodz, Poland	452,000	('21)
London, England	7,476,000	('21)
Lucknow, India	241,000	('21)
Lyon, France	562,000	('21)
Madras, India	527,000	('21)
Madrid, Spain	751,000	('20)
Magdeburg, Germany	286,000	('19)
Manaos, Brazil	76,000	('20)
Manchester, England	731,000	('21)
Mandalay, Burma	149,000	('21)
Maracaibo, Venezuela	47,000	('20)
Marseille, France	586,000	('21)
Mekka, Hedjaz	70,000	
Melbourne, Australia	795,000	('21)
Messina, Italy	177,000	('21)
Mexico, Mexico	1,080,000	('10)
Milan, Italy	718,000	('21)
Mombasa, Kenya	40,000	('21)
Monterey, Mexico	74,000	('10)
Montevideo, Uruguay	351,000	('22)
Montreal, Canada	619,000	('21)
Moscow, Russia	1,028,000	('21)
Mukden, Manchuria	158,000	
Mulhouse, France	99,000	('21)
Munich, Germany	631,000	('19)
Nagoya, Japan	430,000	('20)
Nanking, China	380,000	('21)
Nantes, France	184,000	('21)
Naples, Italy	780,000	('21)
Newcastle, England	275,000	('21)
Nice, France	156,000	('21)
Ningpo, China	271,000	('21)
Nizhni Novgorod, Russia	88,000	('21)
Nottingham, England	263,000	('21)
Nuremberg, Germany	353,000	('19)
Odessa, Russia	432,000	('21)
Oporto, Portugal	203,000	('20)
Osaka, Japan	1,253,000	('20)
Oslo, Norway	258,000	('20)
Ottawa, Canada	108,000	('21)
Palermo, Italy	400,000	('21)
Panama, Panama	67,000	('20)
Para, Brazil	236,000	('20)
Paris, France	2,906,000	('21)
Peking, China	1,300,000	('21)
Pernambuco, Brazil	239,000	('20)
Perth, Australia	155,000	('21)
Pilsen, Czechoslovakia	88,000	('21)
Piræus, Greece	131,000	('20)
Pisa, Italy	68,000	('21)
Plymouth, England	210,000	('21)
Port Arthur, Canada	15,000	('21)
Port au Prince, Haiti	120,000	
Porto Alegre, Brazil	179,000	('20)
Port Said, Egypt	91,000	('17)
Portsmouth, England	247,000	('21)
Prague, Czechoslovakia	676,000	('21)
Puebla, Mexico	96,000	('10)
Quebec, Canada	95,000	('21)
Quito, Ecuador	81,000	('19)
Rangoon, Burma	342,000	('21)
Reggio, Italy	83,000	('21)
Regina, Canada	34,000	('21)
Reims, France	77,000	('21)
Reval, Esthonia	123,000	('22)
Riga, Latvia	185,000	('20)
Rio de Janeiro, Brazil	1,158,000	('20)
Rome, Italy	691,000	('21)
Rosario, Argentina	265,000	('22)
Rotterdam, Netherl'ds	516,000	('20)
Rouen, France	124,000	('21)
Saigon, Fr. Indo-China	83,000	('21)
St. Etienne, France	168,000	('21)
St. John, Canada	47,000	('21)
St. Johns, Newfoundland	34,000	('18)
Salonica, Greece	170,000	('20)
San Luis Potosi, Mexico	68,000	('10)
San Salvador, Salvador	81,000	('22)
Santiago, Chile	507,000	('20)
Santiago de Cuba, Cuba	70,000	('20)
Santo Domingo, Dom. R.	31,000	('21)
Santos, Brazil	103,000	('20)
São Paulo, Brazil	579,000	('20)
Sebastopol, Russia	73,000	('21)
Seoul, Chosen	250,000	('20)
Shanghai, China	1,500,000	('21)
Sheffield, England	491,000	('21)
Singapore, Straits Set.	387,000	('19)
Smyrna, Turkey	375,000	('12)
Sofia, Bulgaria	154,000	('20)
Soochow, China	500,000	('21)
Southampton, Eng.	161,000	('21)
Stettin, Germany	233,000	('19)
Stockholm, Sweden	422,000	('22)
Stoke upon Trent, Eng.	240,000	('21)
Strasbourg, France	167,000	('21)
Stuttgart, Germany	309,000	('19)
Sydney, Australia	898,000	('21)
Sydney, Canada	23,000	('21)
Tabriz, Persia	200,000	
Taganrog, Russia	68,000	('13)
Tampico, Mexico	18,000	
Tananarivo, Madagascar	63,000	('11)
Tangier, Morocco	50,000	('21)
Tashkent, Turkestan.	245,000	('21)
Teheran, Persia	220,000	
Tientsin, China	800,000	('21)
Tiflis, Georgia	347,000	('15)
Tokyo, Japan	2,173,000	('20)
Tomsk, Siberia	119,000	('21)
Toronto, Canada	522,000	('21)
Toulouse, France	175,000	('21)
Tours, France	75,000	('21)
Trebizond, Turkey	55,000	
Trieste, Italy	239,000	('21)
Tripoli, Libia	73,000	
Trondhjem, Norway	55,000	('20)
Tucuman, Argentina	91,000	('14)
Tunis, Tunis	172,000	('21)
Turin, Italy	502,000	('21)
Valencia, Spain	244,000	('20)
Valladolid, Spain	71,000	('18)
Valparaiso, Chile	182,000	('20)
Vancouver, Canada	117,000	('21)
Venice, Italy	172,000	('21)
Vera Cruz, Mexico	49,000	('10)
Victoria, Canada	39,000	('21)
Vienna, Austria	1,841,000	('20)
Vilna, Poland	215,000	('14)
Vladivostok, Far E., Rus.	90,000	
Warsaw, Poland	931,000	('21)
Wellington, New Zeal'd	111,000	('22)
West Ham, England	301,000	('21)
Winnipeg, Canada	179,000	('21)
Yarkand, Sinkiang	60,000	
Yokohoma, Japan	423,000	('20)
Zanzibar, Zanzibar	35,000	
Zürich, Switzerland	207,000	('20)

INDEX AND PRONUNCIATIONS

MARKINGS: **ā** in **lāte**, **ă** in **făt**, **â** in **câre**, **ä** in **fär**, **à** in **làst**, **ạ** in **faḷl**, **ȧ** in **sofȧ**, **au** in **author**; **c** in **can**, **ç**=**s**, **çh**=**sh**; **ē** in **mē**, **ĕ** in **rĕturn**, **ĕ** in **mĕt**, **bĕrry**, **ę** in **vęll**, **ē** in **tērm**; **ġ** in **ġem**, **g̃** in **g̃et**; **ī** in **fīne**, **ĭ** in **tĭn**, **ï** in **polïce**; **K** = German *ch*; **n̄** = **ng**, **N** = **ng** in its effect (nasal) on the preceding vowel, but is not itself sounded; **ō** in **nōte**, **ŏ** in **ŏbey**, **ŏ** in **nŏt**, **o͝** in **so͝ft**, **ô** in **fôr**, **ȯ** in **sȯn**, **ọ** in **wọlf**, **o͞** in **do͞**, **o͞o** in **schо͞ol**, **o͝o** in **wo͝ol**; **ş** = **z**; **th** in **thine**; **ū** in **tūne**, **ŭ** in **nŭt**, **û** in **bûrn**, **u͝** in **fu͝ll**, **u͞** in **ru͞de** (= **o͞**), **ü** = French *u*, **ua** = **wa**, **ue** = **we**; **x̱** = **gz**; **ȳ** in **mȳ**, **y̆** in **hy̆mn**. *Italic letters are silent.*

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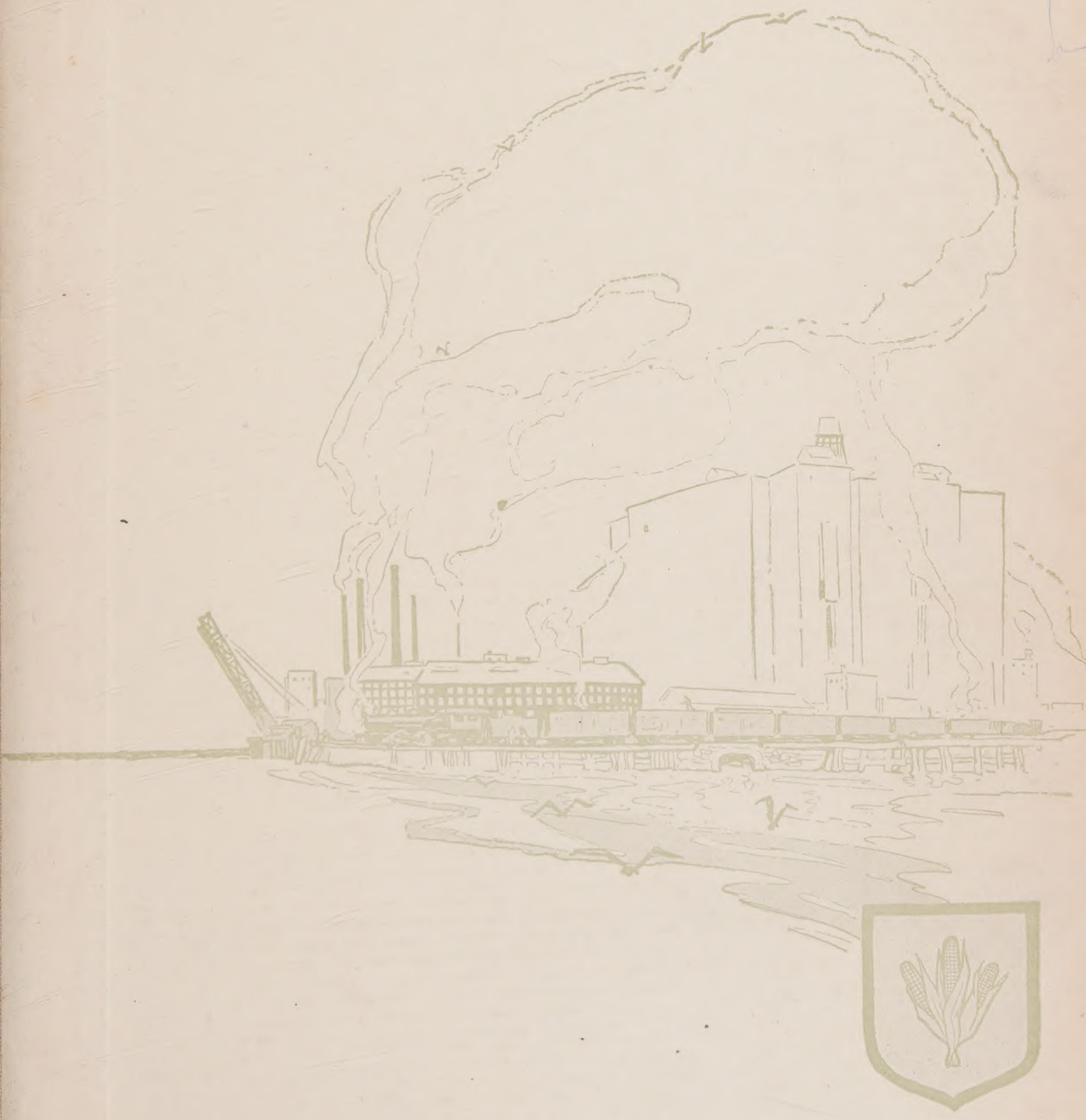

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